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# 1. Before we get started

Before diving into ArcGIS, make sure you have downloaded the zip file with data for this lab assignment - the download link or file will be located in the same place you obtained this document - and have extracted it to a folder that you can find later on. In a few steps of this tutorial, we will move that folder to where the rest of our GIS data is located.

If extracting data from zip files is new to you, then I recommend downloading 7-zip, a free tool that can open compressed files of all types: https://www.7-zip.org/ - once you have installed it, you can right click on any zip file and go to the 7-zip submenu to *extract* the contents of the zip file. A folder with the data will appear in the same location as the zip file.

# 2. Introduction

In this lab, we'll use a number of conventions to help you understand ArcGIS. When you see a numbered list, like below:

1. Then it means that each number is an action for you to do in order.
2. Each number in the list will correspond to a numbered icon in the screenshot shown (when possible).
3. Look for the number in the screenshot to see visually the order of steps for you to

Every so often, instead of putting each numbered step into a list, we may put it into a sentence in parentheses (4). Those numbers still correspond to the numbers in the image.

We'll also typically *italicize* rather than "quote" new terminology or a specific thing we want you to do (such as the name of an item we want you to click, like the *Symbology* menu). We do this because it's often easier to read than quoting and removes the confusion quotes can create with new users.

Finally, we highly recommend that you put all of your lab data folders inside a single folder that you are comfortable finding later. This tutorial was developed using the path C:\GIS, but you may not be able to use this on your own computer (especially when using cloud desktops - your data will be deleted between sessions). Instead of using that folder for new projects, keep your project in the default location ArcGIS suggests. Whenever we reference data in this lab, we'll be giving you paths relative to C:\GIS though, so you'll need to translate that path initially to the location in your own ArcGIS Project folder.

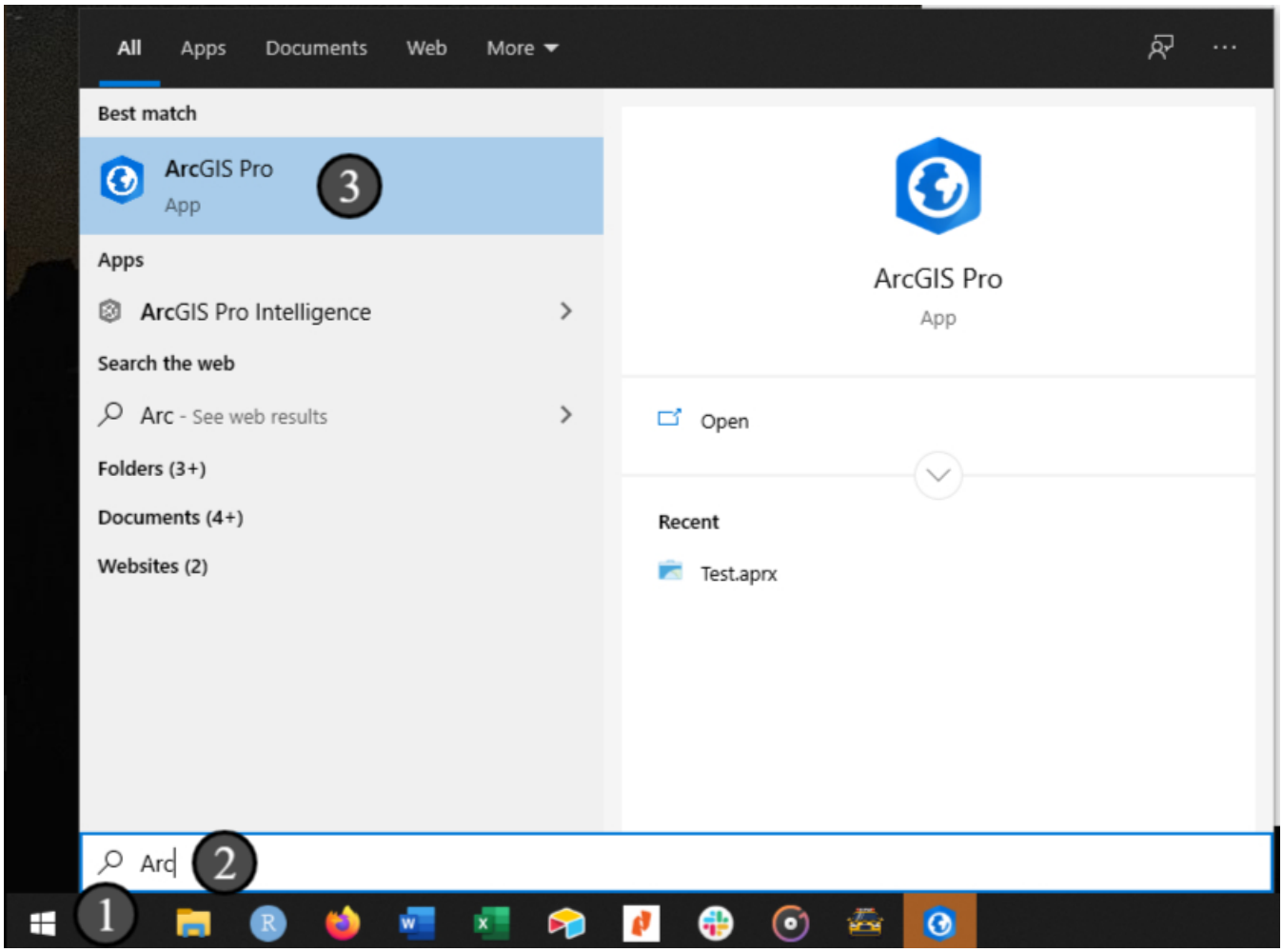
# 3. Scenario: GIS Analyst

Imagine you're a new GIS analyst a small nonprofit in California that focuses on water and habitat conservation in the state's coastal watersheds. The first task your supervisor has asked you to work on is to put together a basic map of streams and soils in the Navarro River watershed, a small watershed along the state's northern coast. They want to use the map as part of planning additional work in the region and up until now, all they've had available is Google Maps, which emphasizes roads and doesn't include soils data. They gave you a *geodatabase* with all the data you need to get started, but asked you to figure out the rest.

## 4. Open up ArcGIS Pro

First, let's open up ArcGIS Pro. You can do this any way you know how, but if you're less familiar with Windows, the easiest way is to search for it.

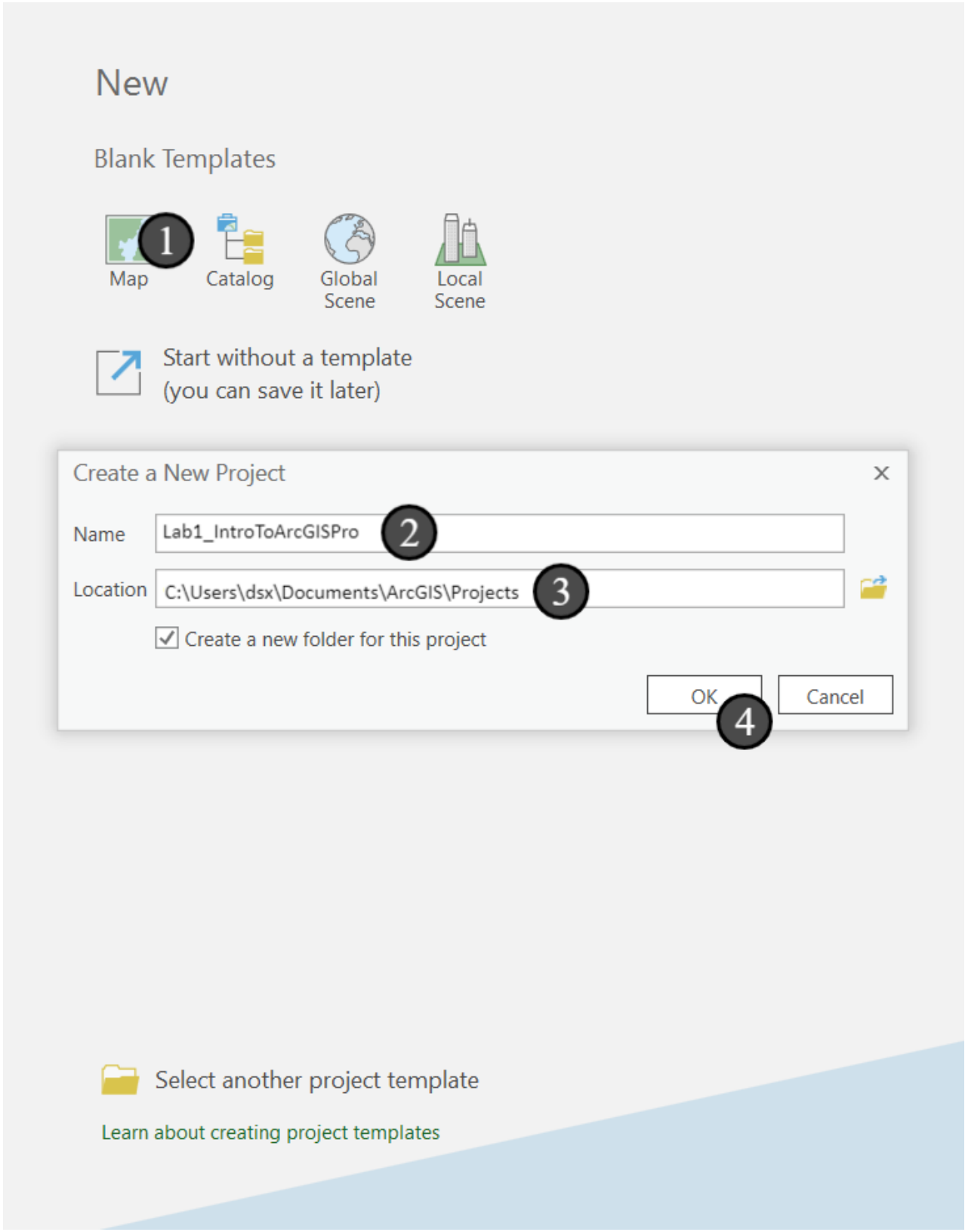
1. Click on the Start (Windows) button.
2. Start typing your search terms - in this case, *Arc*
3. Click on the *ArcGIS Pro* tile when it appears, and ArcGIS will launch, showing a loading screen first.



## 5. Create a new project

When ArcGIS Pro loads from the Start menu, it gives you the option to create a new project based on several templates. If you have used ArcGIS Pro before, you may see a list of recent projects. Feel free to explore the initial menu for a moment.

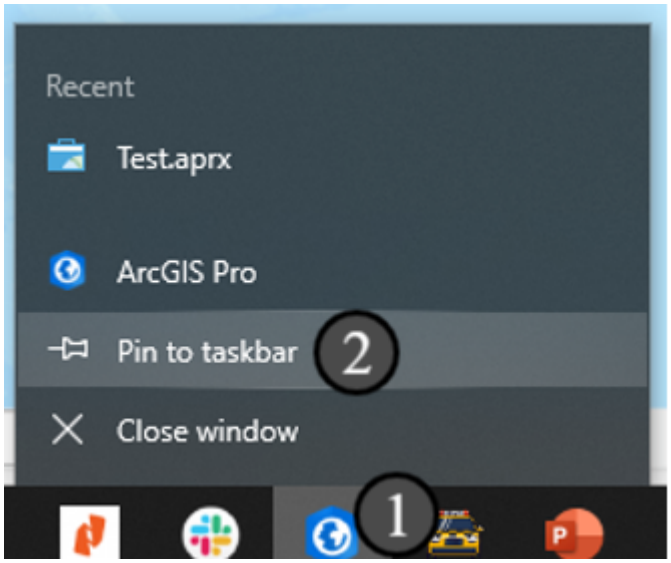
1. Click the *Map* button.
2. Name your project *Lab1_IntroToArcGISPro*. This will create a new folder by that name in the Location specified in the next step item. Always make sure that your project has a good title so that you will remember what is in the project if you need to come back to it after a long time.
3. You can put this project in the folder of your choice, but we recommend using the default folder ArcGIS suggests. To work here, you'll need to feel comfortable finding and working in your *Documents* folder. Note that if you do use another location, you will need to adapt any paths provided in later steps, though this is mostly automatic in ArcGIS. Paths shown here use my user account name "dsx", so your paths **will look different** - don't copy the paths here - just leave the default path.
4. Click "OK".


New
Blank Templates
1
Map
Catalog
Global Scene
Local Scene
Start without a template
(you can save it later)
Create a New Project
Name
Lab1_IntroToArcGISPro
2
Location
C:\Users\dsx\Documents\ArcGIS\Projects
3
Create a new folder for this project
OK
4
Cancel
Select another project template
Learn about creating project templates

## 5.1 Pin to taskbar for quick access

I like to be able to quickly access ArcGIS when I need it without having to search for it every time, so I pin it to my taskbar. If you like, you can do the same.

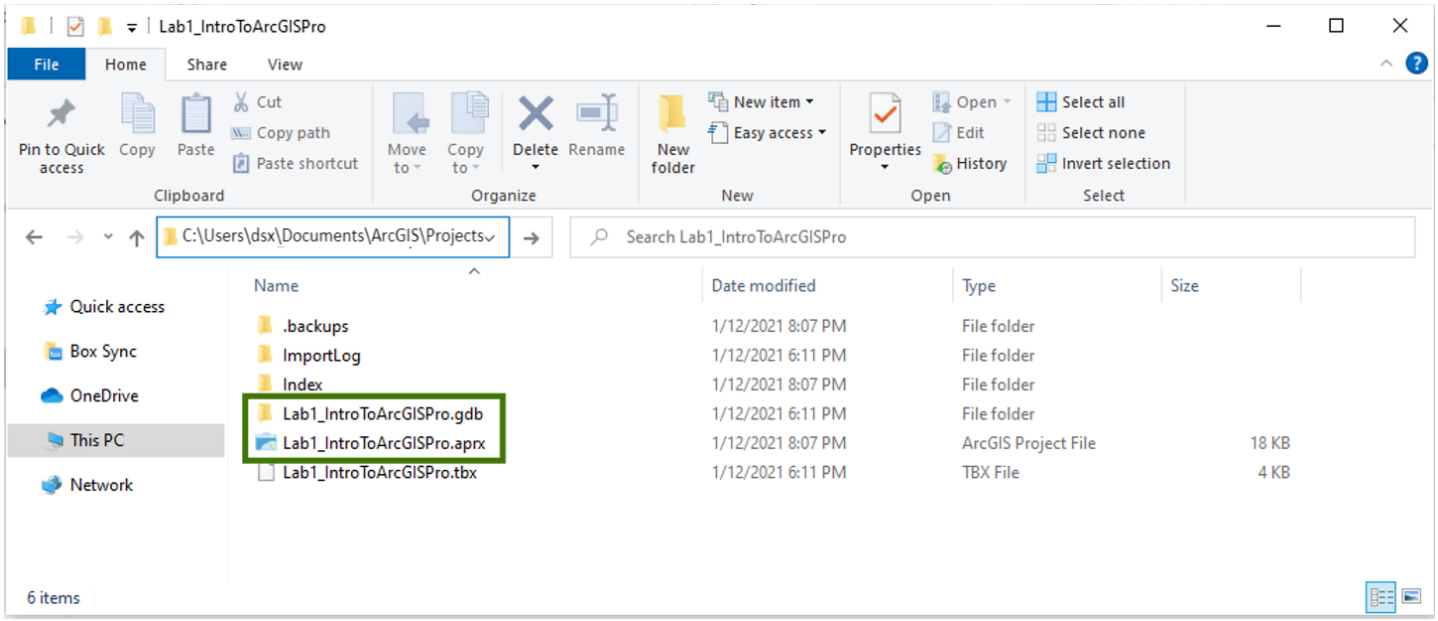
1. Right click on the ArcGIS Pro icon on the taskbar
2. Select *Pin to taskbar* in the menu that comes up.



## 5.2 ArcGIS Pro Project Structure

Now let's take a moment to explore your new project folder. Open *File Explorer* in Windows and navigate to the folder that you specified as the Location (e.g. C:\GIS\) and double-click the new project folder *Lab1_IntroToArcGISPro* to open it up and see its contents. Several files and folders have been created by default.

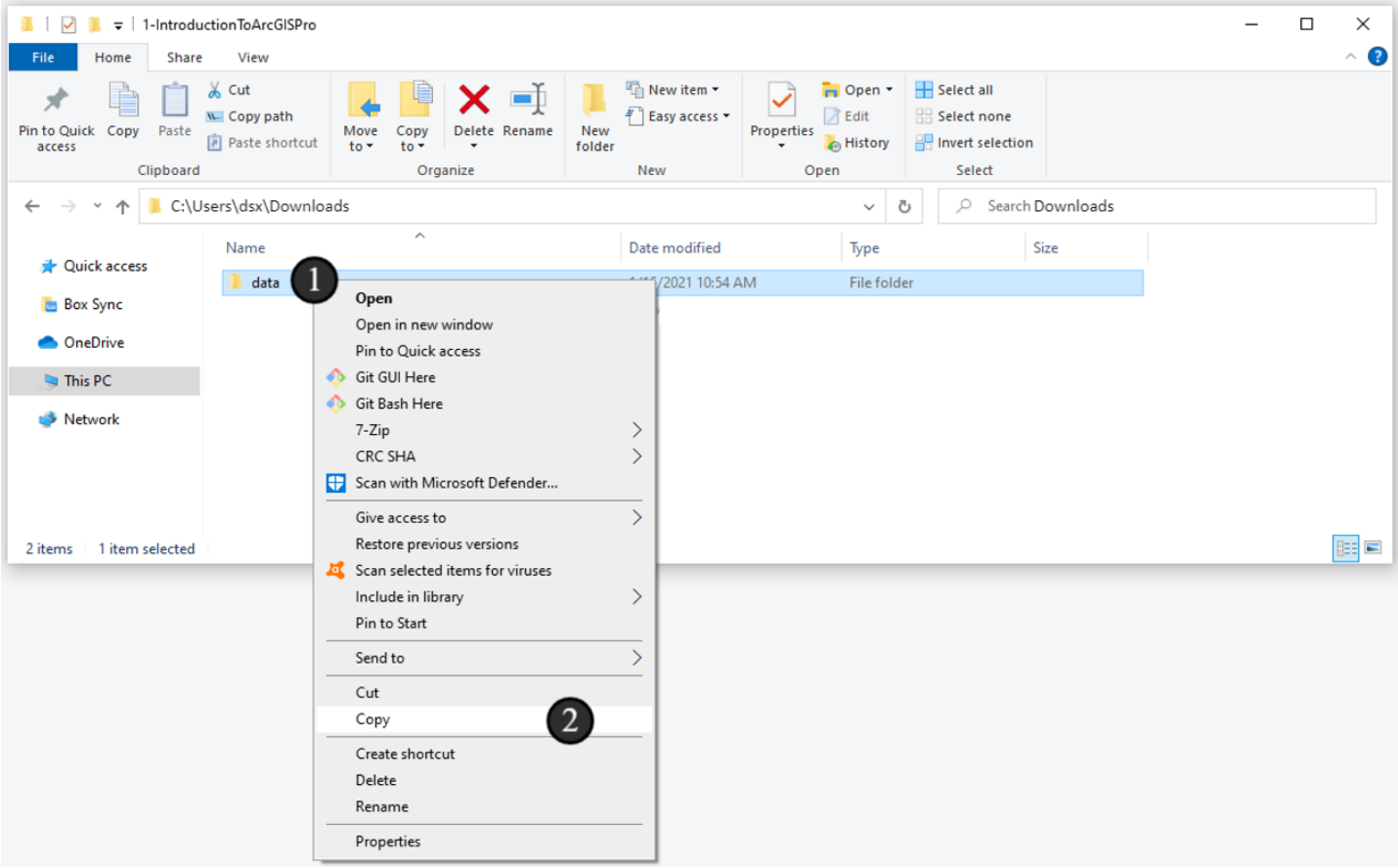
- The file *Lab1_IntroToArcGISPro.arpx* is the ArcGIS Pro *Project File* itself; this can be used to open your project directly if you double clicked it (no need to do that now though.
- The *folder* entitled *ProjectName.gdb* is a *Geodatabase* and can store spatial information, though it is empty right now. ArcGIS creates it automatically when we make a new project and this particular geodatabase functions as your *Default Geodatabase*, which we will discuss later on.



## 5.3 Move data folder to Project folder

Next, navigate to the folder that you placed your downloaded and extracted data into before you began this tutorial (here, C:\GIS\Lab_Downloads) and open the folder 1-IntroductionToArcGISPro. You should see a folder named "data".

1. Right click on the folder
2. Then click `Copy` to copy the folder to your clipboard

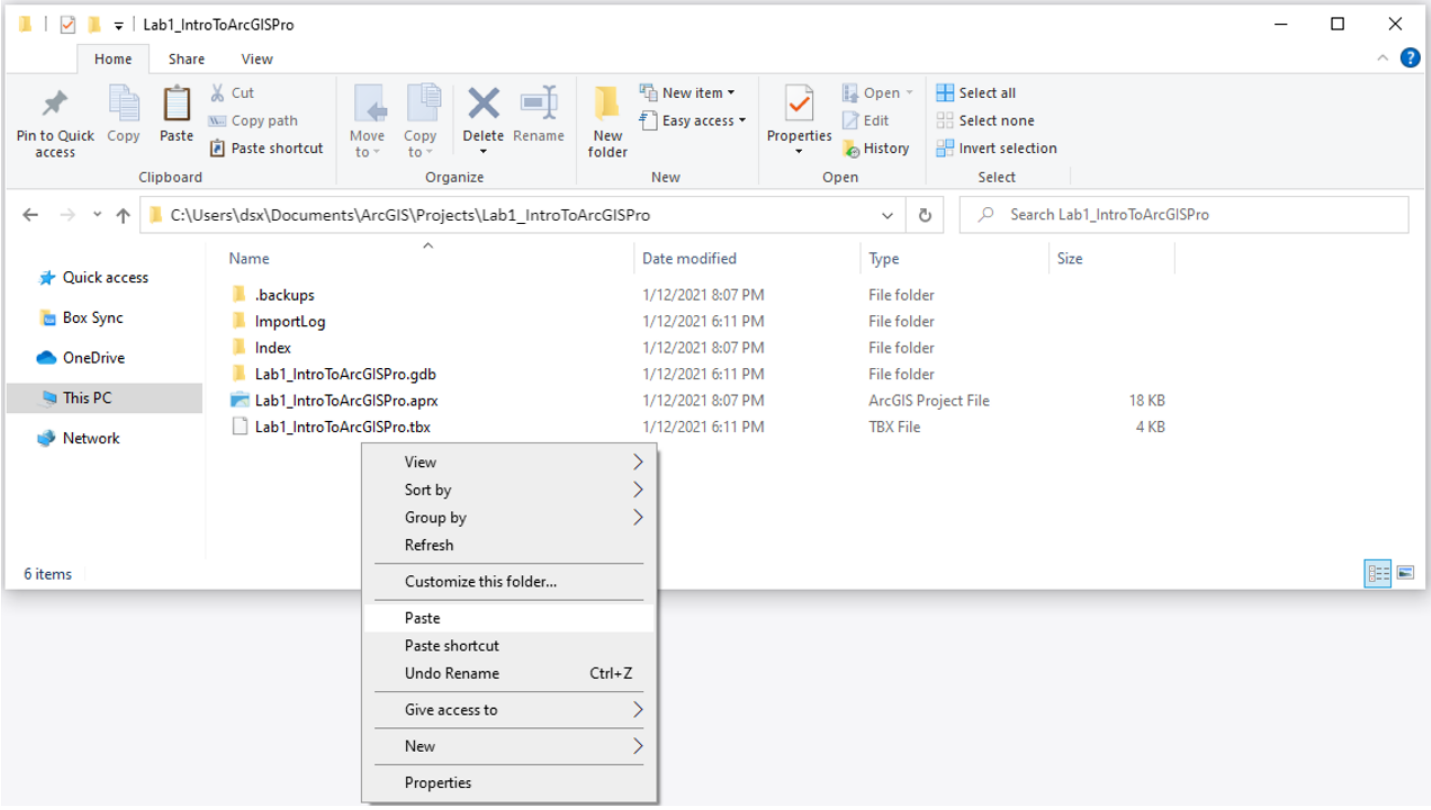


## 5.4 Move the data folder - pasting

Navigate to the project folder that you created in step 4, and paste the data folder into that folder. You should now have a folder called *data* in the same folder as the default files that were created when you made a new project in ArcGIS Pro.

**Note:** This strategy of putting all of your data into the project folder is a *data management* strategy that emphasizes keeping your project data all in one place, which makes it easy to find the relevant files and has the advantage of being portable--you can move the project folder to different locations on your computer (or share with different users) without having to adjust your filepaths. This strategy is especially useful when you have a lot of different projects that use different datasets.

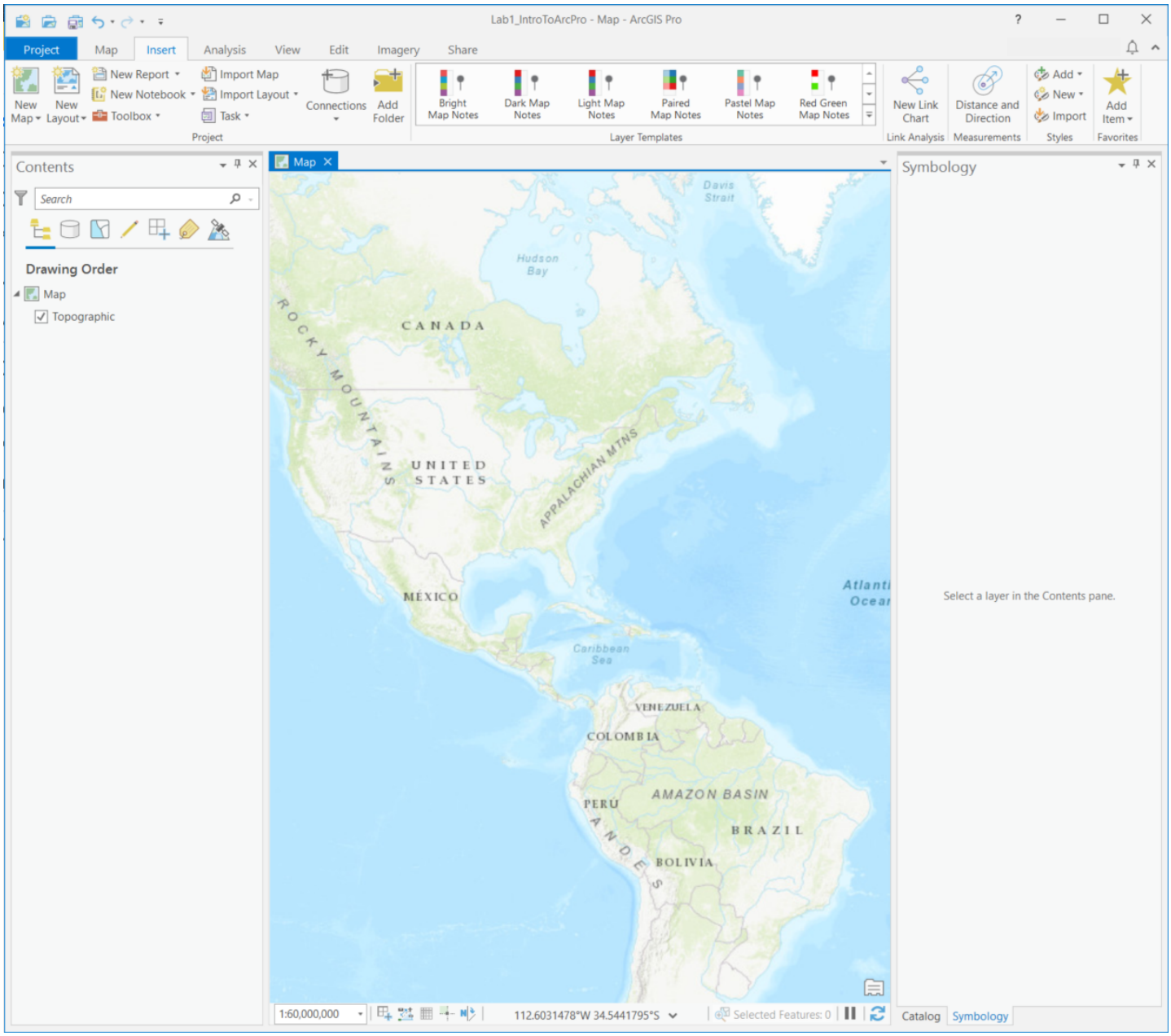
There are disadvantages to this approach. For example, if you frequently use the same large datasets in a variety of different projects, making a copy of the source data for each project may take up too much room on your hard drive or make the data difficult to update. In that case, keeping your source data in a separate location may be a better approach. This is also true when you have multiple users accessing the same dataset and need to be sure that everyone is using the same version of the data. In these situations, it is often best to keep the raw data in a centralized location outside of your project folder, then save any new files that you create from that data inside of the project folder.



# 6. The main interface

Return to your open ArcGIS Pro project, and take a look around the window. What do you notice about the interface? What kinds of conventions is it using? It has a *ribbon* with different tabs for different menu categories, and *panes* that can attach to different sides of the screen or be detached to become floating *windows*. Take some time to look through the menus and hover your mouse over different icons to see what they do.

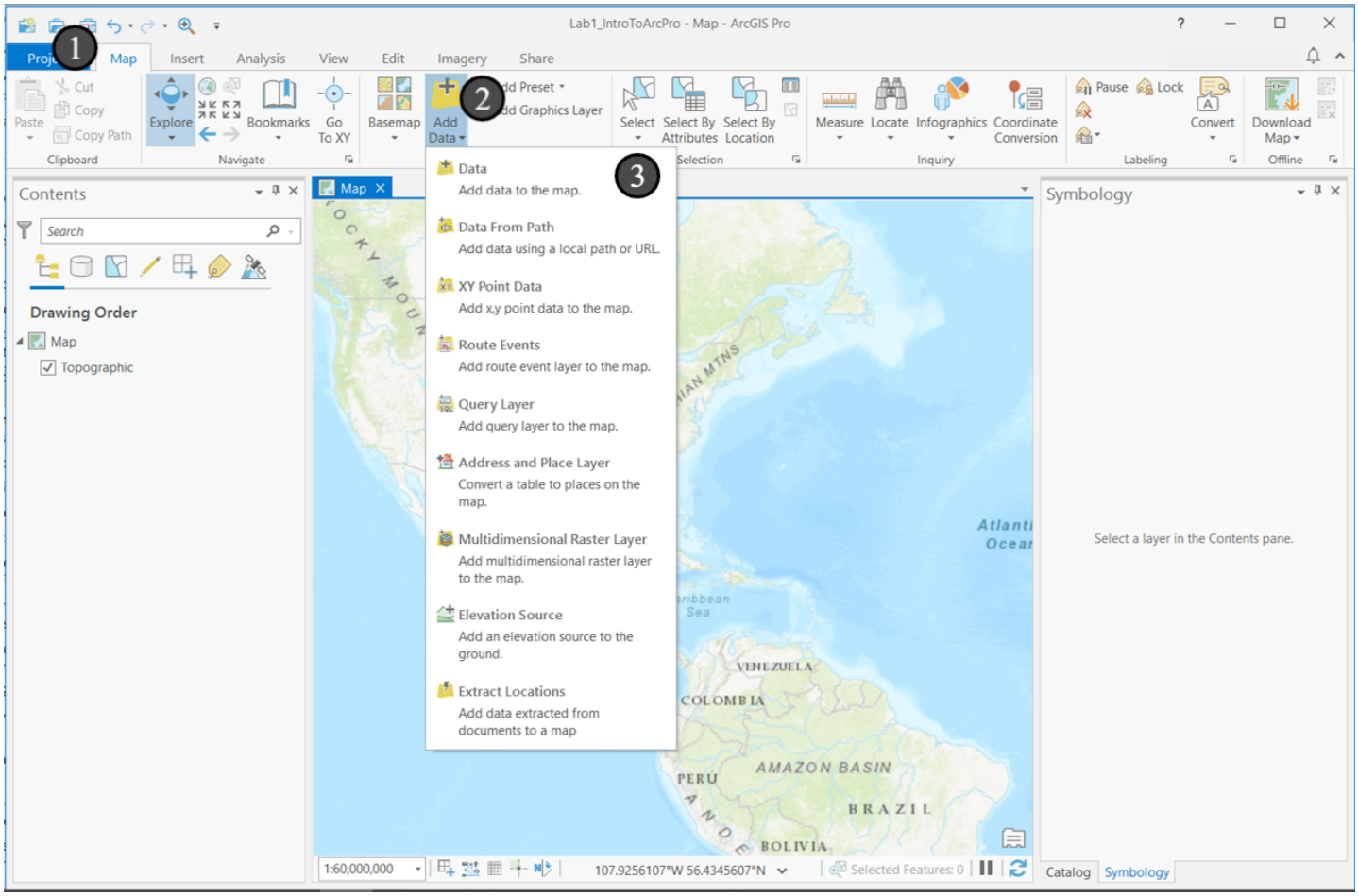
When we start ArcGIS Pro by creating a Map Project, as we did a few steps back, the default view consists of the *Contents pane* on the left and the *Map* view in the center. On the right will be a rotating set of panes that includes anything you had open last time you used ArcGIS Pro, so for you it will probably show the default *Catalog* pane.



## 6.1 Adding data to your map

Now it's time to make ArcGIS do some work! In order to make our map of rivers and soils, we need to add some data. Let's add some spatial data to our map!. To do this,

1. Make sure the *Map* tab is active - if it's not, click on it.
2. Click the Add Data button in the main toolbar. Note that if you click on the down arrow you will get a dropdown menu with lots of options; if you click on the icon itself, you will jump straight to the first option in the list which by default opens the *Add Data Dialog Box*.
3. If you clicked the down arrow, click *Data,* the first option, to open the Add Data Dialog Box.



## 6.2 The Add Data Dialog Box

The Add Data Dialog Box may look familiar to other dialogs you've seen to open documents or select a file in other applications. But it will also look different. Instead of showing you your computer's files, it's showing you all of the different data sources it can read from - servers, databases, online sources, your computer, and more.

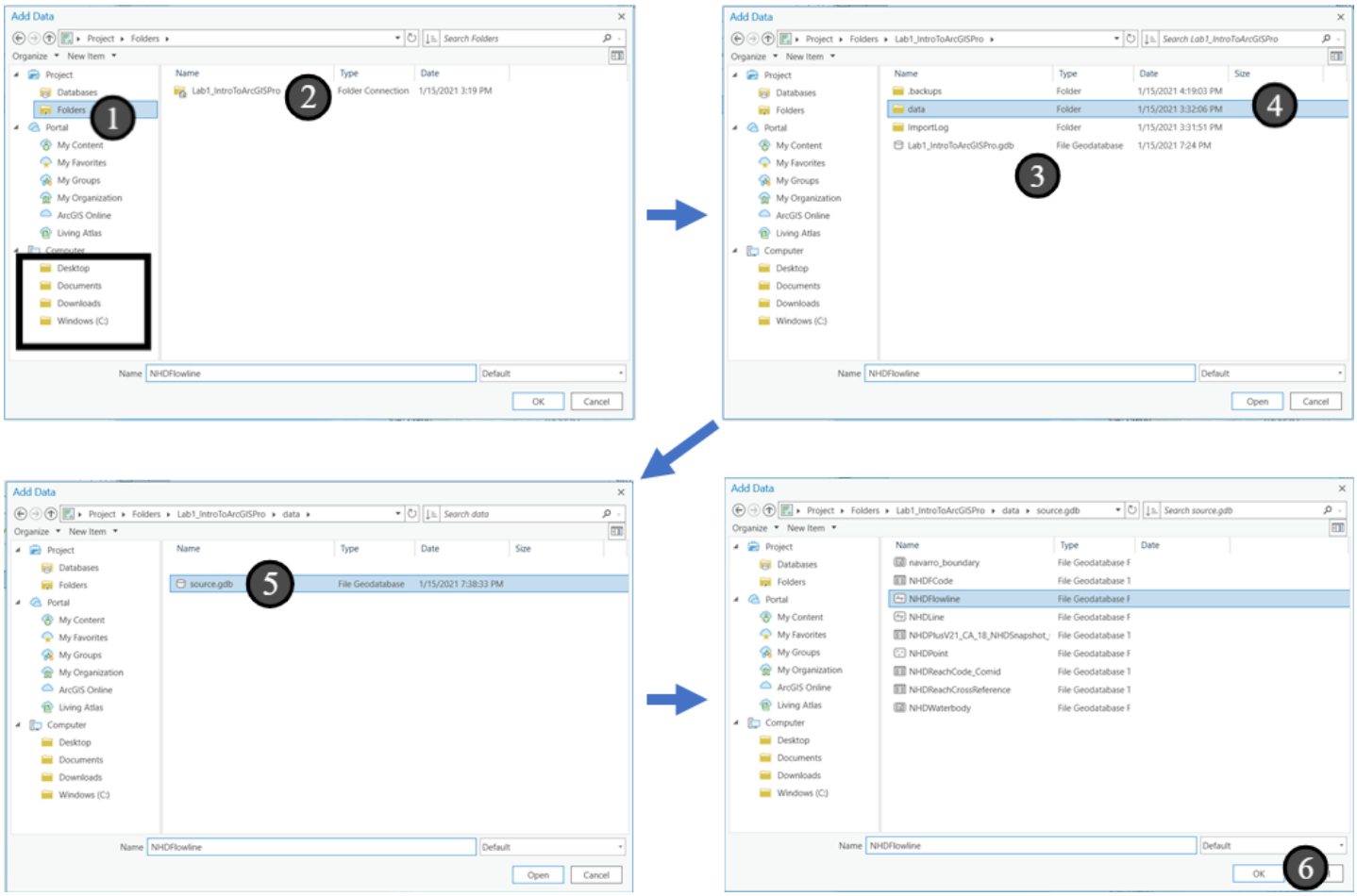
In the pane on the left, click the option for *Folders* (1). Do you recognize the folder in the main pane? It should be your project folder (notice the small home icon on top of the folder icon, indicating it's the project's directory). Double-click that folder to open it (2). Also notice that if you wanted to look elsewhere on your computer, you can access your user account's folders and hard drives in the bottom left.

Think back to when you opened the project folder in Windows Explorer earlier. Note the icon for the filename ending in *.gdb* (3); it no longer resembles the other folders. ArcGIS recognizes the folder as a *file geodatabase*. A *geodatabase* is a type of database that stores its contents as a directory of files on your computer. It's a way to group all kinds of geospatial data together. We'll learn more about them later, but for now, note the file extension and that the icon for a geodatabase is different from folder icons in order to tell you at a glance that it's a geodatabase.

In the same screen, you should also see the data folder that you copied into your project folder. Double-click to open (4).

Inside, you will see an additional file geodatabases (again, note the icon and file type). Double-click *source.gdb*. (5) to see its contents.

Now we're looking at the contents of the geodatabase - simple tables and spatial data, including point, line, and polygon datasets! Select NHDFlowline from the items in the geodatabase, then click OK (6) to add it to your map.

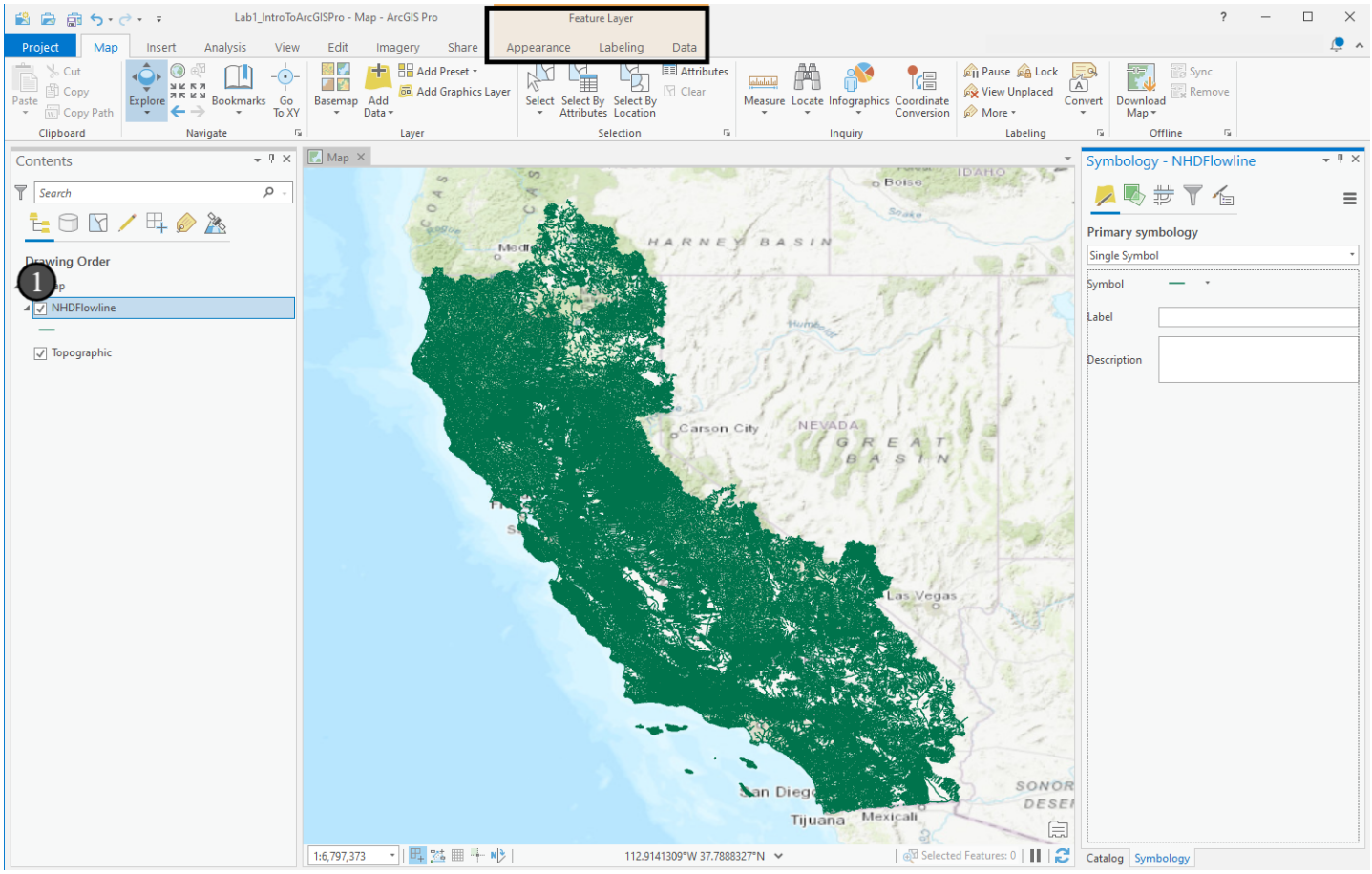

Add Data
1
2
Lab1_IntroToArcGISPro
Folder Connection
1/15/2021 3:19 PM
Name NHDFlowline
Default
OK
Cancel
Add Data
3
4
.backups
data
ImportLog
Lab1_IntroToArcGISPro.gdb
File Geodatabase
1/15/2021 7:24 PM
Open
Cancel
Add Data
5
source.gdb
File Geodatabase
1/15/2021 7:38:33 PM
Add Data
navarro_boundary
NHDFCode
NHDFlowline
NHDLine
NHDPoint
NHDReachCode_Comid
NHDReachCrossReference
NHDWaterbody
6

# 7. What is it?

Your screen will slowly draw a large blob - what is it? Can you figure it out from the layer name or the shape? Can you figure out how to zoom around and look closer? On my computer, ArcGIS chose to show this data in green; yours may show up in another color. We'll change it to a more appropriate color later.

From what I see, it's a pretty solid green mass, with some breaks in it, covers most of the state of California, and is named NHDFlowline. In the Contents pane on the left, notice that you have a listing for this layer (consider for a moment why it's called a *layer*). We can leave the item in our map, but turn it off so we can't see it, but can see other layers underneath instead. We do this by clicking the check box next to its name to clear the checkbox. (1). Click the check box again to turn the layer back on.

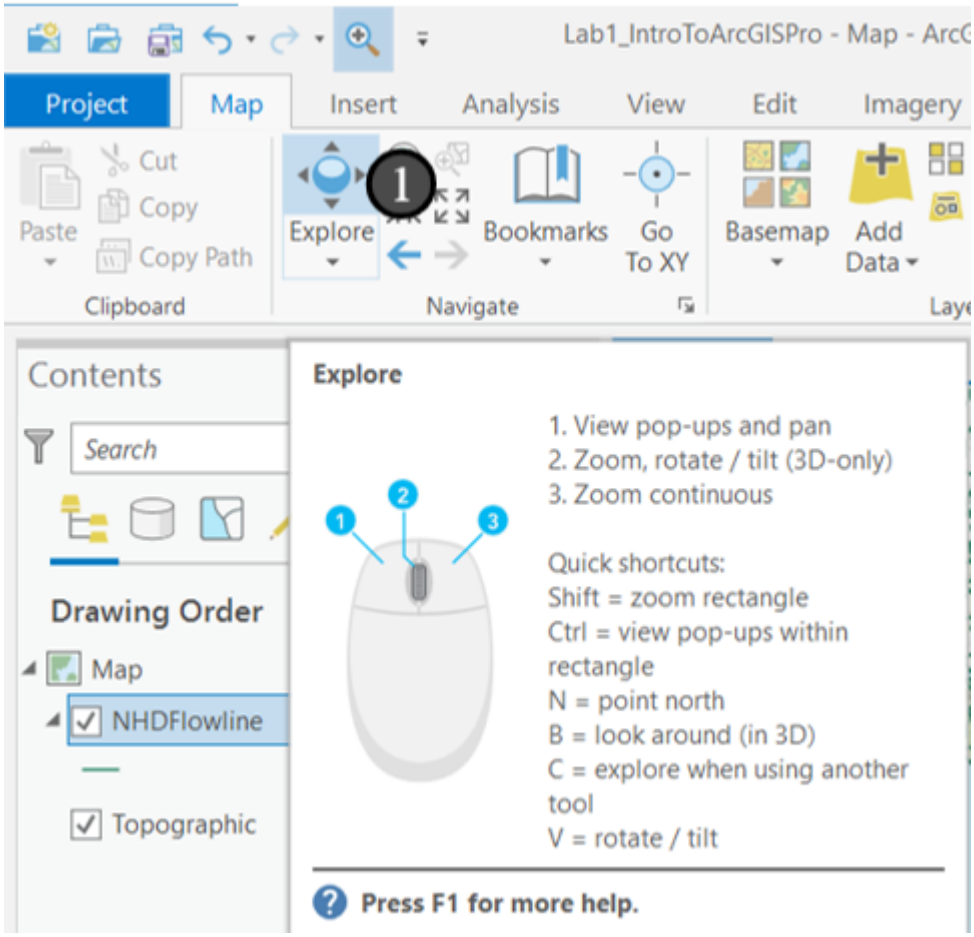
Note also the *context sensitivity* of ArcGIS Pro. When the NHDFlowline layer is selected in the Contents pane, we get a new set of tabs at the top with a group label of *Feature Layer* - feel free to look through them. Notice also that in this screenshot, the righthand pane changed - yours might not change though if your righthand pane shows *Catalog* instead of symbology - this is OK - we'll get into what symbology is at a later time, but for now, note that panes and tabs can both be sensitive to what you're doing elsewhere in the application, including what is selected in the Contents pane and what tools you're using.



## 8. Zooming in

Let's figure out what this data is. There are multiple ways to explore the map. Hover (1) on top of the Explore button in the Map tab in the ribbon at the top of the main window for a quick overview. For example, you can use your mouse scroll wheel or two fingers on a laptop trackpad as you would with online map applications to zoom in. Feel free to try that now.

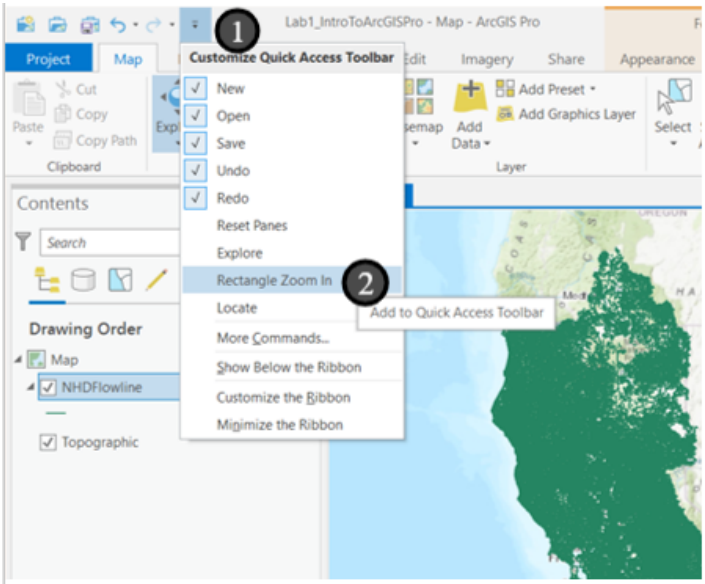
Many places in the application have similar popups if you hover over them, showing you usage information and keyboard shortcuts. If an item is disabled and you want to use it, hovering over it will frequently tell you **why** it's disabled even! The application has help icons in many places that you can hover over as well.

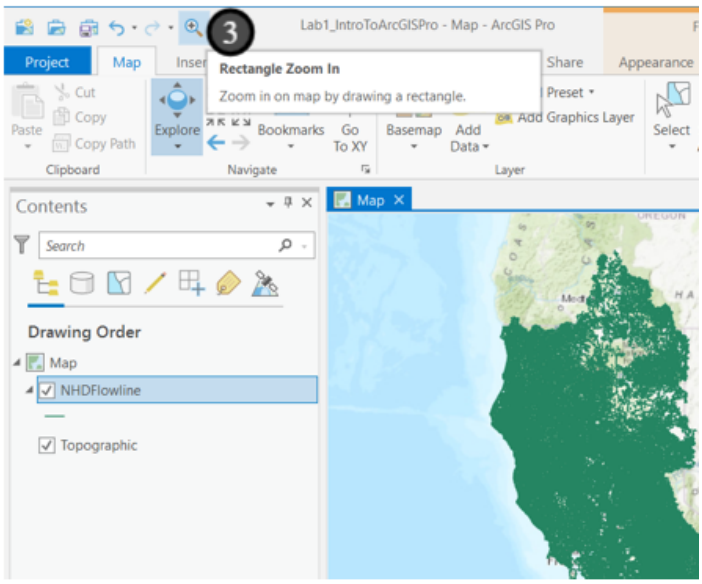


## 8.1 Rectangle Zoom

If you prefer to select a specific area and zoom to that without having to use shift (e.g. if you're using two fingers on a laptop trackpad), you can add the rectangle zoom tool to the Quick Access Toolbar and use that to zoom to a specific area.

1. Click the down arrow at the right side of the *Quick Access Toolbar* (these are buttons that are available to you all the time, no matter which ribbon is active)
2. Click on *Rectangle Zoom In* to check the box next to it and add the tool to the toolbar
3. Click the newly added button to activate the Rectangle Zoom In tool.



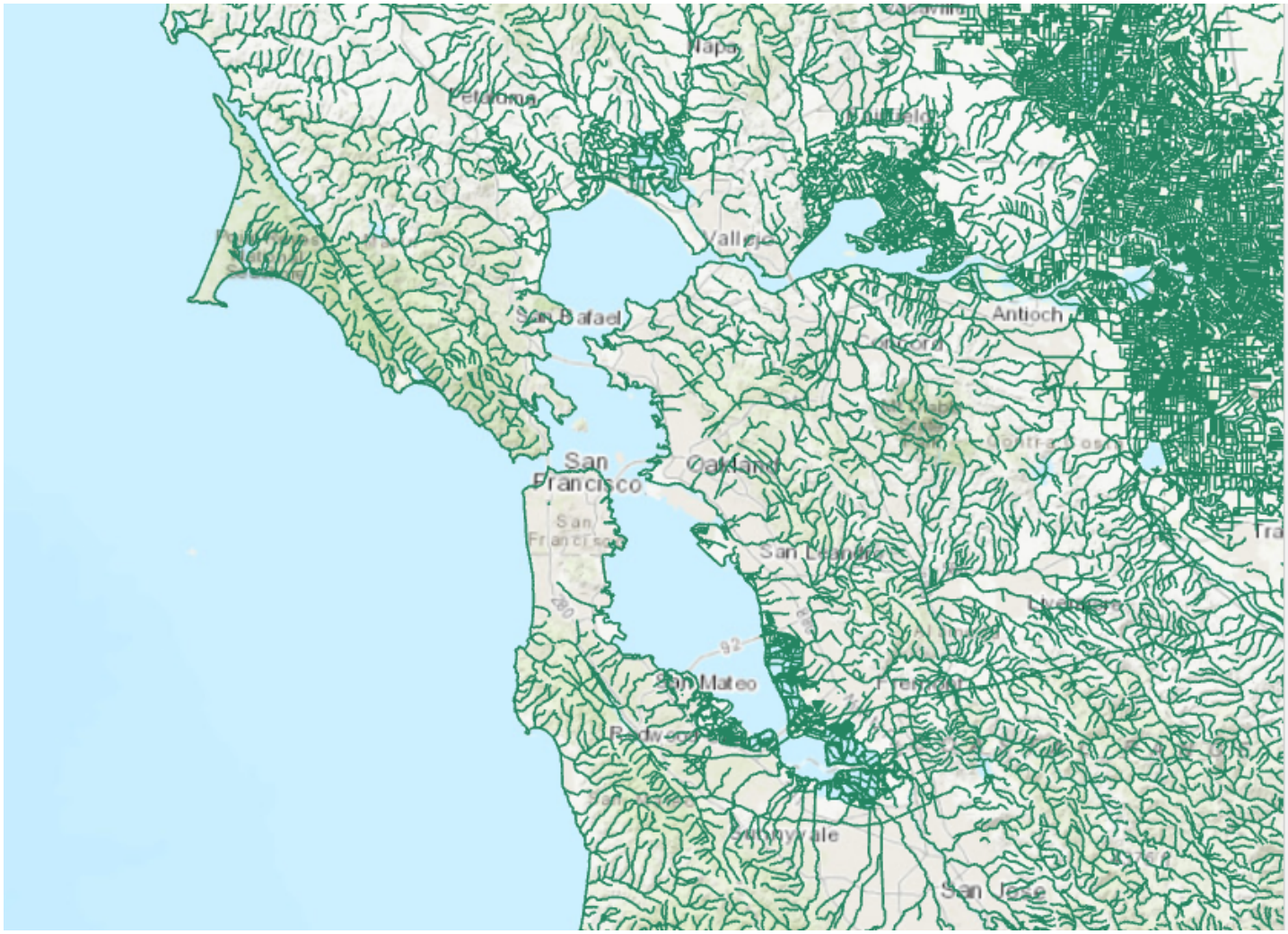
## 8.2 Click and drag

Click in a spot in the map window (1) - somewhere near the middle of the green area in the ocean. **Hold down** the left mouse button and drag it to create a rectangle similar to the screenshot here. This will create the *Extent* that ArcGIS will zoom to and show only this area on your screen.

If you are using a mouse scroll wheel or two fingers on a laptop trackpad, zoom to approximately that area.

## 8.3 A better scale to see features

Now that we are zoomed in, we'll see a lot of lines on the map - what do they mean? Why do they show up as solid green when we are zoomed out? We can start to get a sense of what the data might be - it could maybe be a transportation network or water moving - something that we'd choose to represent with lines. Given the waviness of the lines and that the city of San Francisco doesn't appear to have any, we'd probably speculate that they are rivers, but let's confirm by inspecting the data.

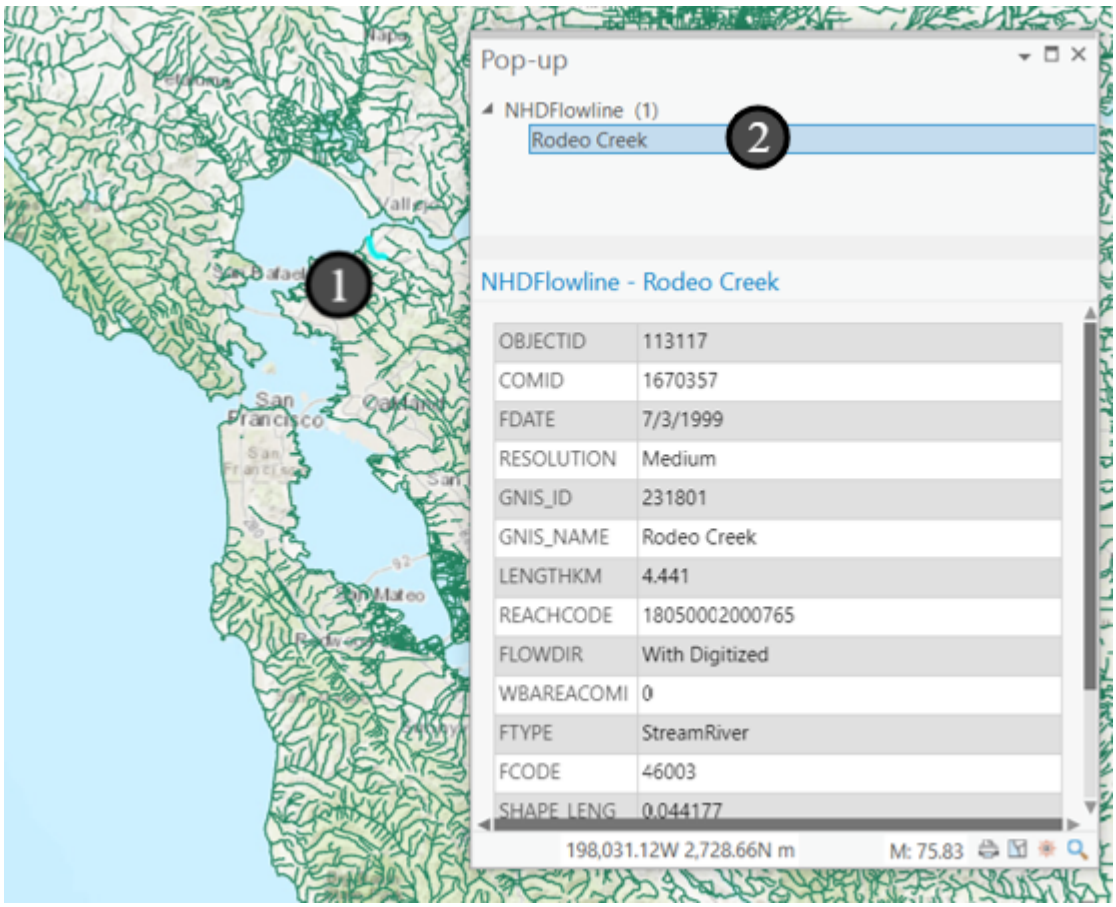


## 8.4 Identifying features

If you were using the magnifying tool to zoom, click on the Explore button in the Map tab on the top ribbon (see step 8). If you were using mouse functions to zoom, this will likely still be selected (it is the default).

In Explore mode, when you click on something (1), the selected feature will flash bright teal and you will get a pop-up pane (2) with *attribute information* for that *feature*. We can think of each of these line segments as features, and each one of them has a set of attributes. Features typically attempt to model some aspect of the real world with a spatial representation (the line) and then describe the spatial representation with attribute data, or fields and values specific to that specific spatial data.

In this screenshot, I've clicked on Rodeo Creek, according to the GNIS_NAME attribute on the feature. Your screen will look different depending on what you click, and not all lines will have an entry for GNIS_NAME. Click on a few features and explore the data a bit - you don't need to find Rodeo Creek, but take a look at the attributes for each and see which ones seem to change and which ones are the same. These attributes seem to confirm our hypothesis that the features we added are rivers (which is correct).

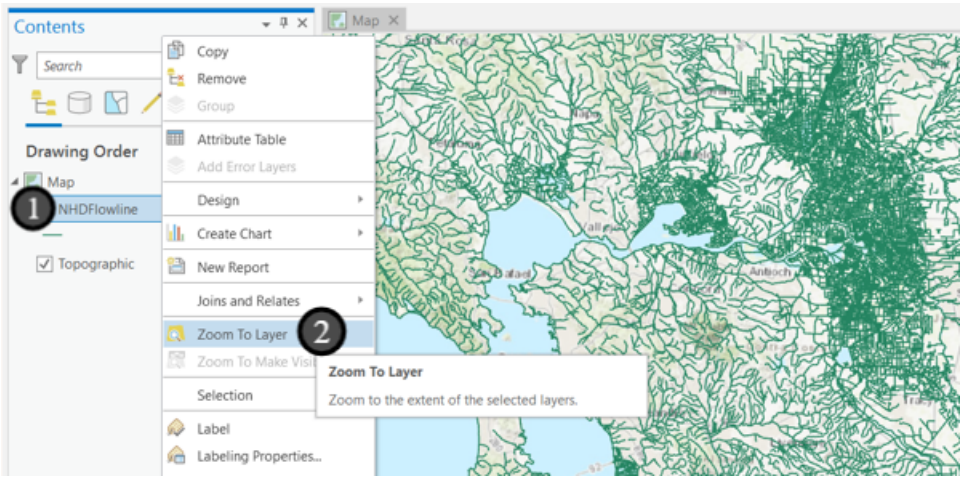


## 8.5 Returning to an overview

Let's zoom back out, but do it quickly.

1. Right click on NHDFlowline in the Contents pane (1)
2. and select Zoom To Layer (2).

This zooms our view out to the layer's full extent (shows the entire layer on screen). This can be a handy tool to have if you ever zoom to a place where you're not sure what you're looking at and zooming in and out manually still isn't getting you close to your data, such as if you zoom in too far or out so far that the data disappears.

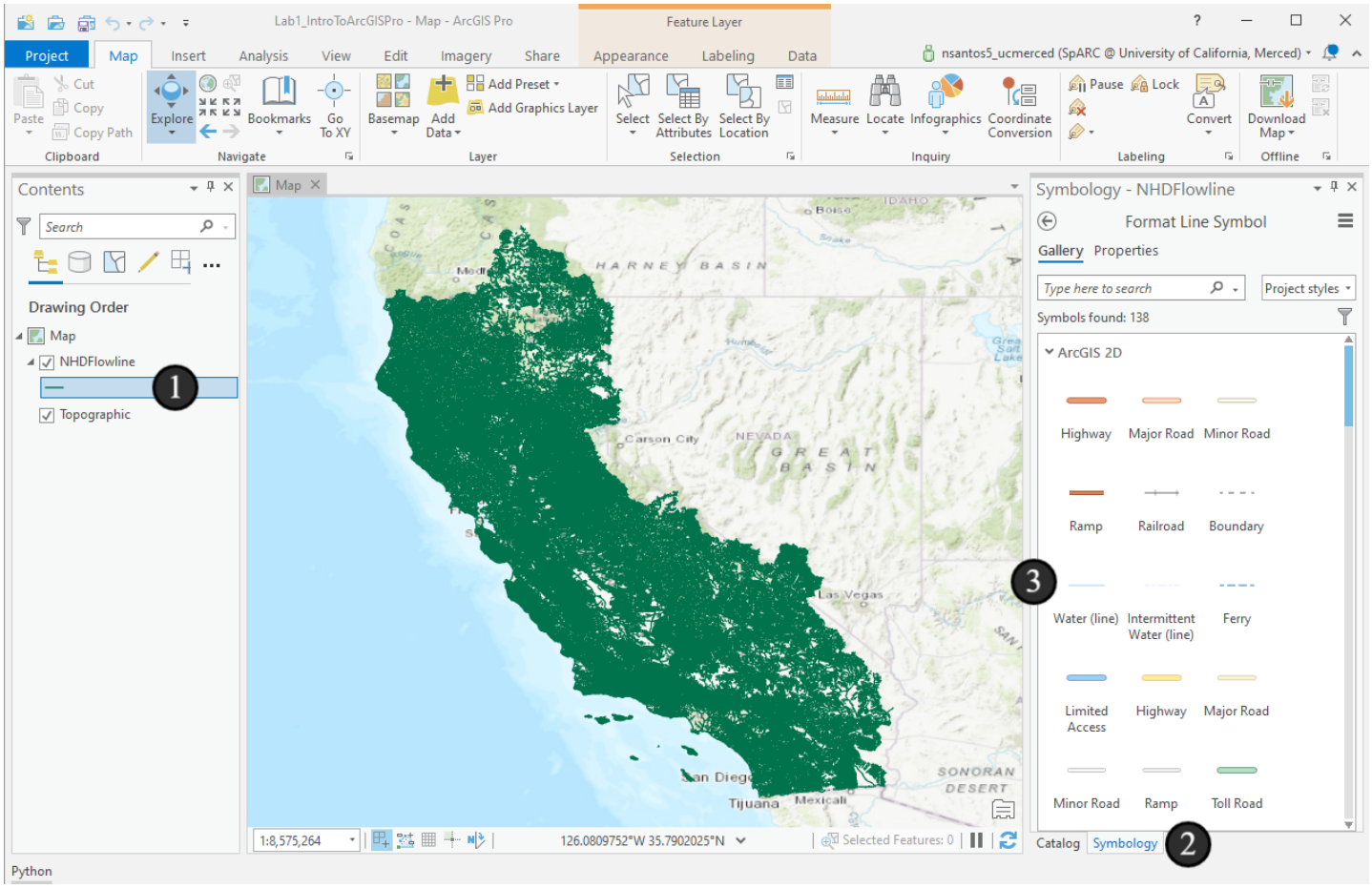


# 9. Setting Symbology

Now that we know we are looking at rivers, let's make them a more appropriate color. To do this, we deal with the portion of cartography called *Symbology*. There are multiple ways to accomplish this in ArcGIS Pro with different options, but for now, we'll use the fastest method.

Symbology is concerned with how we choose to display our GIS data - there is no one way to represent any GIS dataset. You might ask "if the data are rivers, why doesn't it automatically show them as blue?" It may sound like something out of a philosophy class, but the data has no inherent meaning, only the meaning we ascribe to it, so the software isn't aware of what color we think it should be until we choose the color ourselves. This means that you as the analyst and cartographer choose how to show it to the viewer, and have the responsibility of choosing something that makes sense and conveys the information appropriately. As such, ArcGIS provides great flexibility to you to change how your data appears. Let's quickly do that now.

1. Right click on the green (in our copy, yours may be another color right now) line underneath NHDFlowline in the Contents pane. This green line is there both to remind us of the symbology for the layer and also to provide us quick access to change the symbology.
2. The pane on the right will acquire a Symbology tab, and should read Symbology - NHDFlowline across the top.
3. In the Gallery pane, click on the symbol for Water (line). Your map symbology will automatically update.

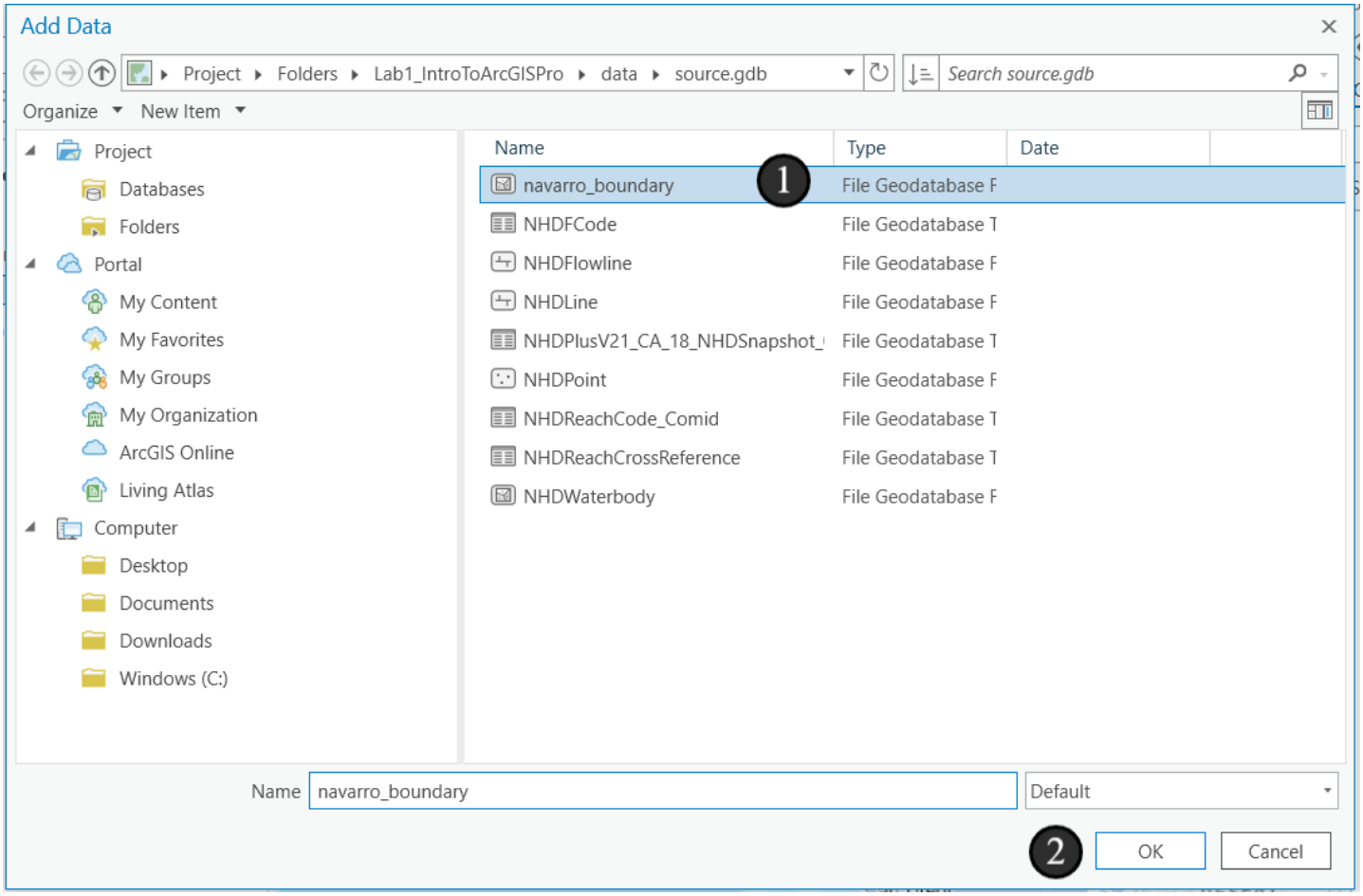


# 10. Add Navarro River Watershed

The NHDPlus Flowline data covers all of hydrologic region 18 (most of California, and parts of Oregon, Nevada, and Arizona). You may have also noticed that it's slow to *render* - that is, to be drawn on your computer screen. So, now we'll add a region of interest that we can use for the rest of this exercise that will limit the drawing time and data processing.

Since we're trying to make a map of the Navarro River area, we'll subset the rivers to show only those that are in the Navarro River Watershed. Watersheds are often good areas of interest because in using them for boundaries, we usually preserve ecological units within them rather than artificially splitting them up. In running an analysis at the scale of a watershed, you can see important interactions at work. If you find your watersheds are splitting up something important, try using a larger watershed unit (or using something else in combination with a watershed) to define your *area of interest (AOI)*.

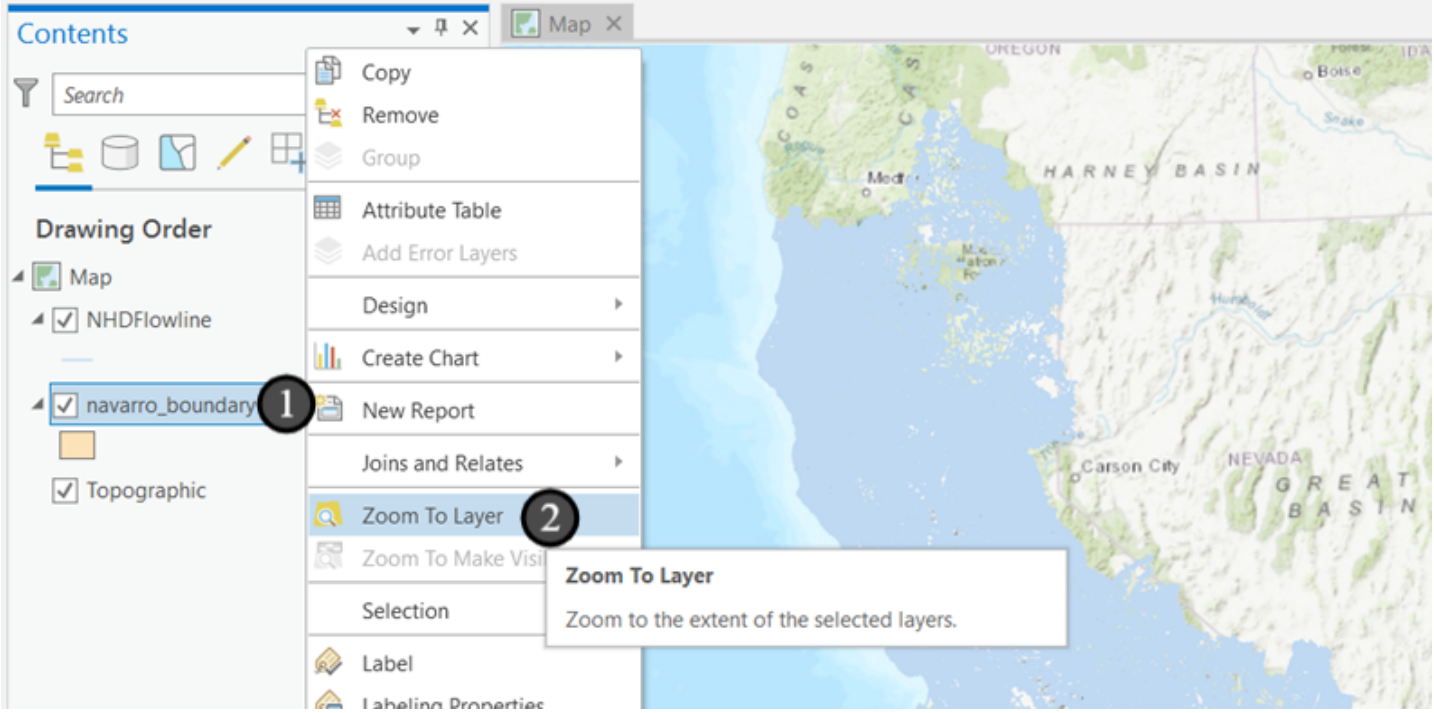
Open the Add Data dialog box (remember how? Look back to when you added the NHDFlowline layer if you forgot). In the same geodatabase as the flowline data is another layer named *navarro_boundary*. Select that (1) and click *OK* (2).



## 10.1 Zoom to the layer

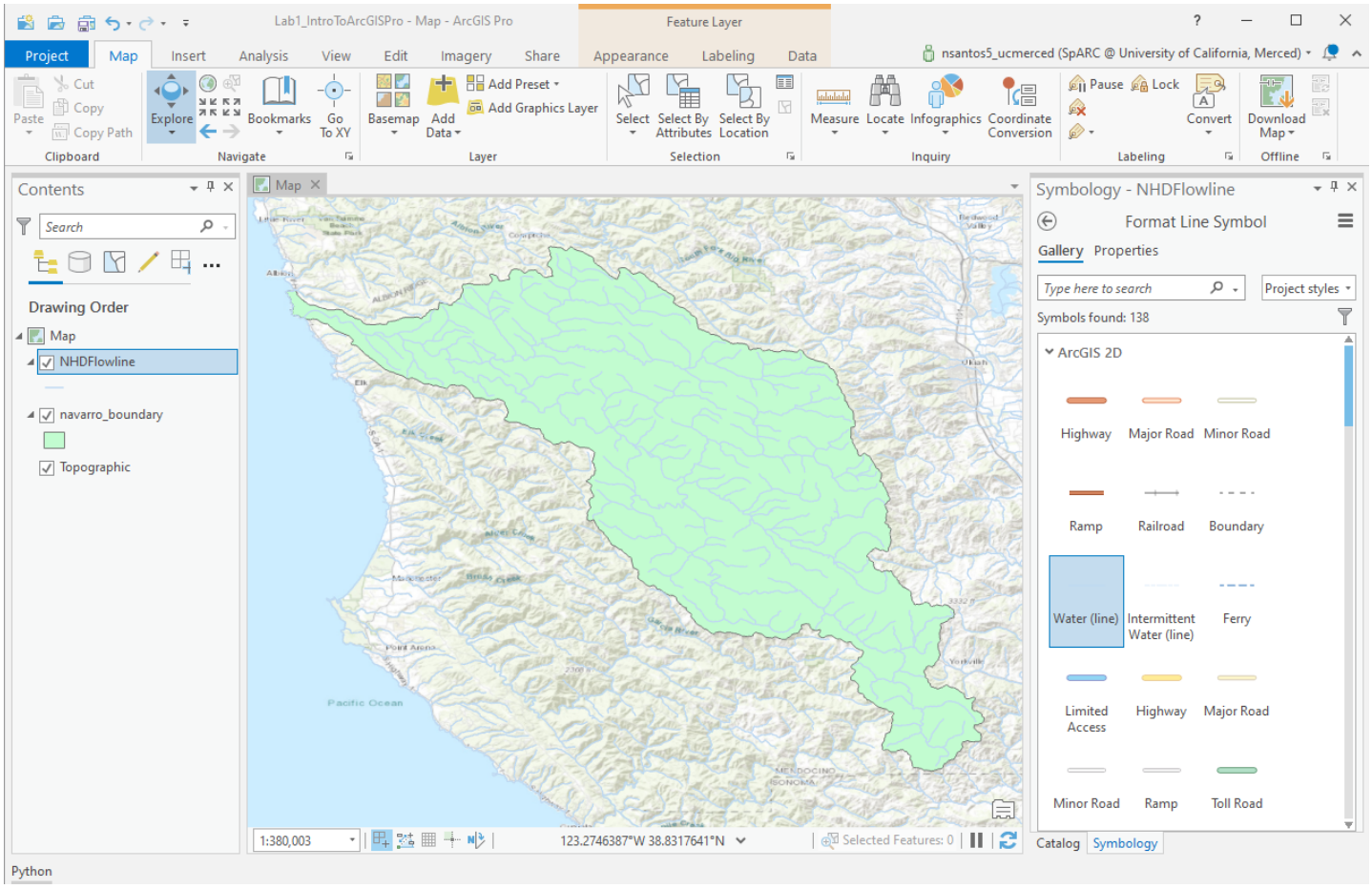
You won't really be able to see the layer at first, so let's zoom directly to it.

1. Right click on the navarro_boundary layer in your table of contents
2. Click *Zoom To Layer.*



## 10.2 The Navarro River Watershed

Once we have zoomed in, we see a *Polygon* outlining the rivers and we can no longer see the *Basemap* (the background data below everything we added). Not that the rivers draw *on top of* the polygon for the Navarro River watershed boundary and that this is because the layer order in the Contents pane has NHDFlowline higher than the navarro_boundary polygon. Clicking and dragging the layers up or down in that list will change the order they draw on the map, potentially obscuring or showing data. ArcGIS tries to be helpful and draw polygons lower than lines by default since polygons are more likely to obscure line data, but you can always change the layer order.

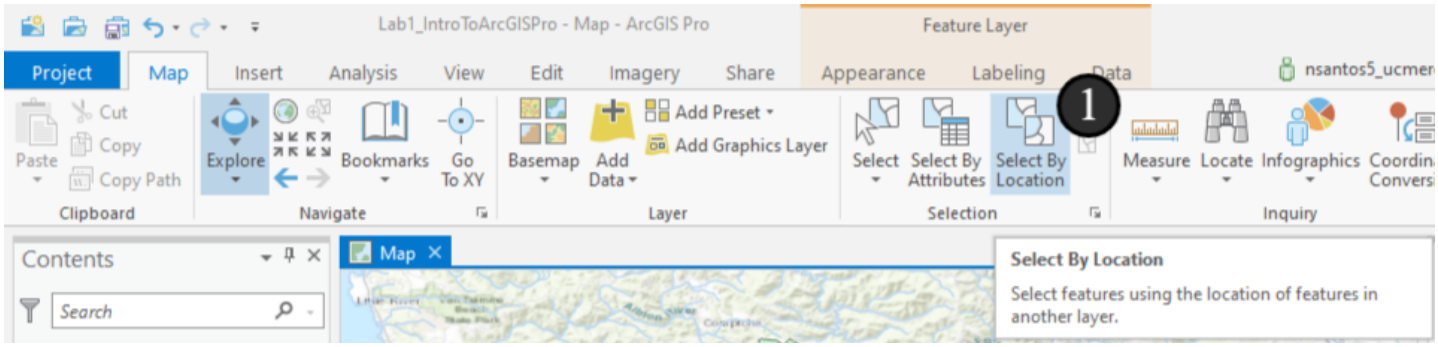


# 11. Select the streams within the watershed

In order to subset our stream data to the Navarro River watershed, we need to first *select* the streams that are part of the watershed. A *selection* is similar to when you highlight a sentence with your cursor in a word processor - you're telling ArcGIS that you want to do operations only on that group of features (in this case, streams). Once we have a selection, we can manipulate it to make a new dataset with just the selected items.

This is where we move from viewing spatial data to using it to conduct analysis based on the spatial information. While we've already looked at records using the identify tool to see what is in a location, what we are doing now is the first time where we are going to **make decisions based on the spatial relationship of two separate datasets**. That's a core functionality in GIS.

1. To get started with this operation, go to the *Selection* section in the top ribbon and click on the *Select By Location* button. A box will pop up.

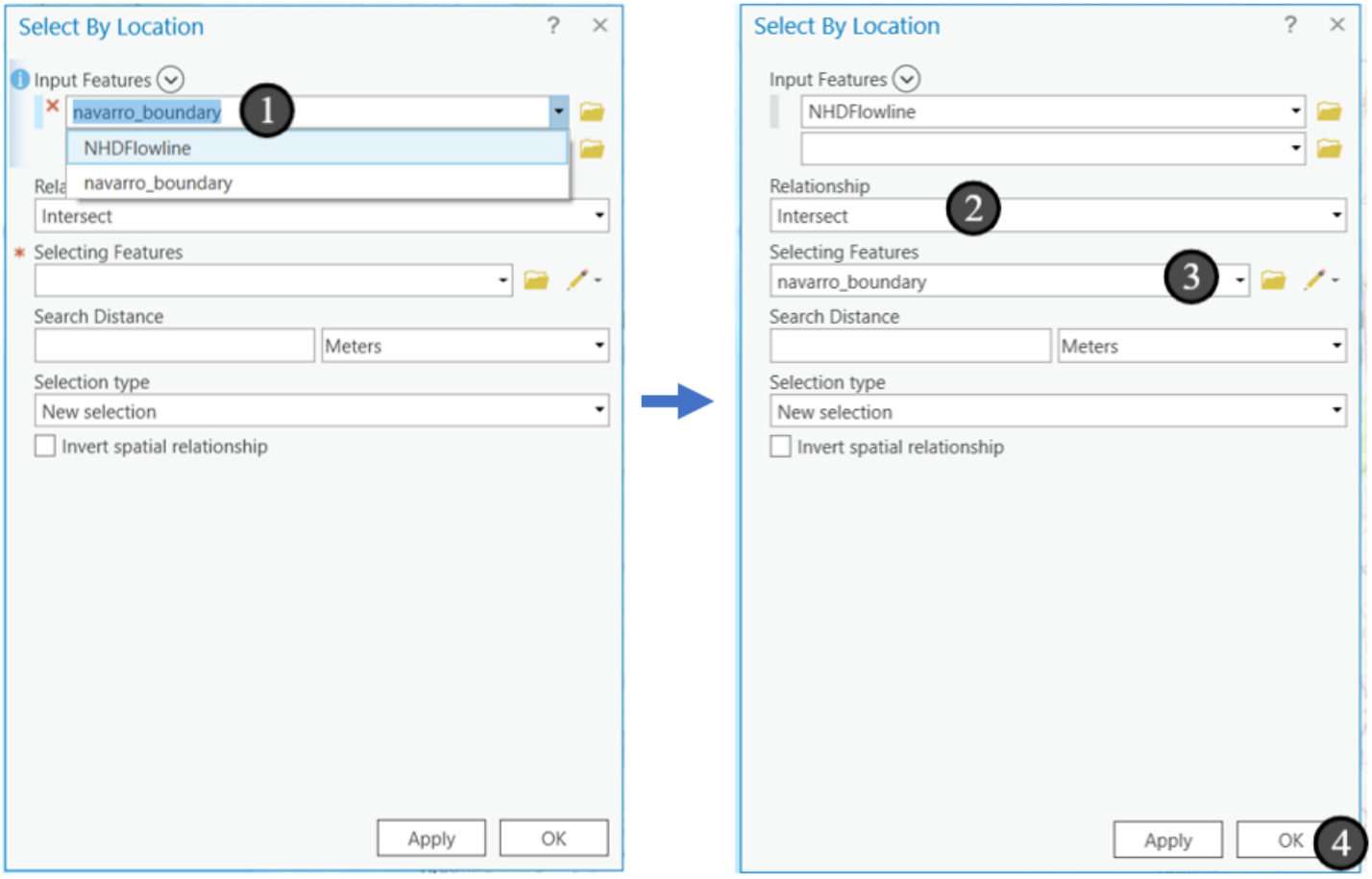


## 11.1 Selecting by location

Select by location creates a selection based upon a relationship to another set of features. It has *many* options, but let's just start with something basic. We're going to select all of the stream lines that touch the Navarro River watershed polygon. Since polygons have *area* associated with them (despite the name "boundary" on this one), all rivers within the watershed will be selected. Many of the parameters will be set correctly by default, but feel free to look around at them.

Before proceeding, I encourage you to take a look and see if you can figure out what to do in this box. Principally, which layer contains the *input features* and which one the *selecting features?* If you want some tips on figuring it out before proceeding, not the little help icon that appears next to each item in the box when you hover over it. You can hover over those for more information.

1. For *Input Features*, click on the arrow on the right of the box to access the dropdown menu. Select NHDFlowline. These are the features we want to select.
2. For *Relationship*, leave the default (*Intersect*). Think of this option as asking you "what relationship does a feature in NHDFlowline (input) and features in navarro_boundary (see next step) need to have in order for the feature in NHDFlowline to be selected?" In this case, they merely need to intersect. Intersect indicates that if the features touch anywhere - no matter how little - then the whole feature in the target layer is selected. Intersections can be complicated at times between different geometries (points, lines, polygons), but in this case the software will select lines that fall anywhere inside the polygon, or which touch its boundary.
3. For *Selecting Features*, select *navarro_boundary* from the dropdown menu. We use navarro_boundary for this option because it is the layer we want to compare with NHDFlowline, but we don't want to select features in it. We want it to guide the selection based on the relationship we selected in the previous step.
4. Click OK to run the selection, leaving the rest as defaults (blank box for *Search Distance*, *New selection* for *Selection type*).

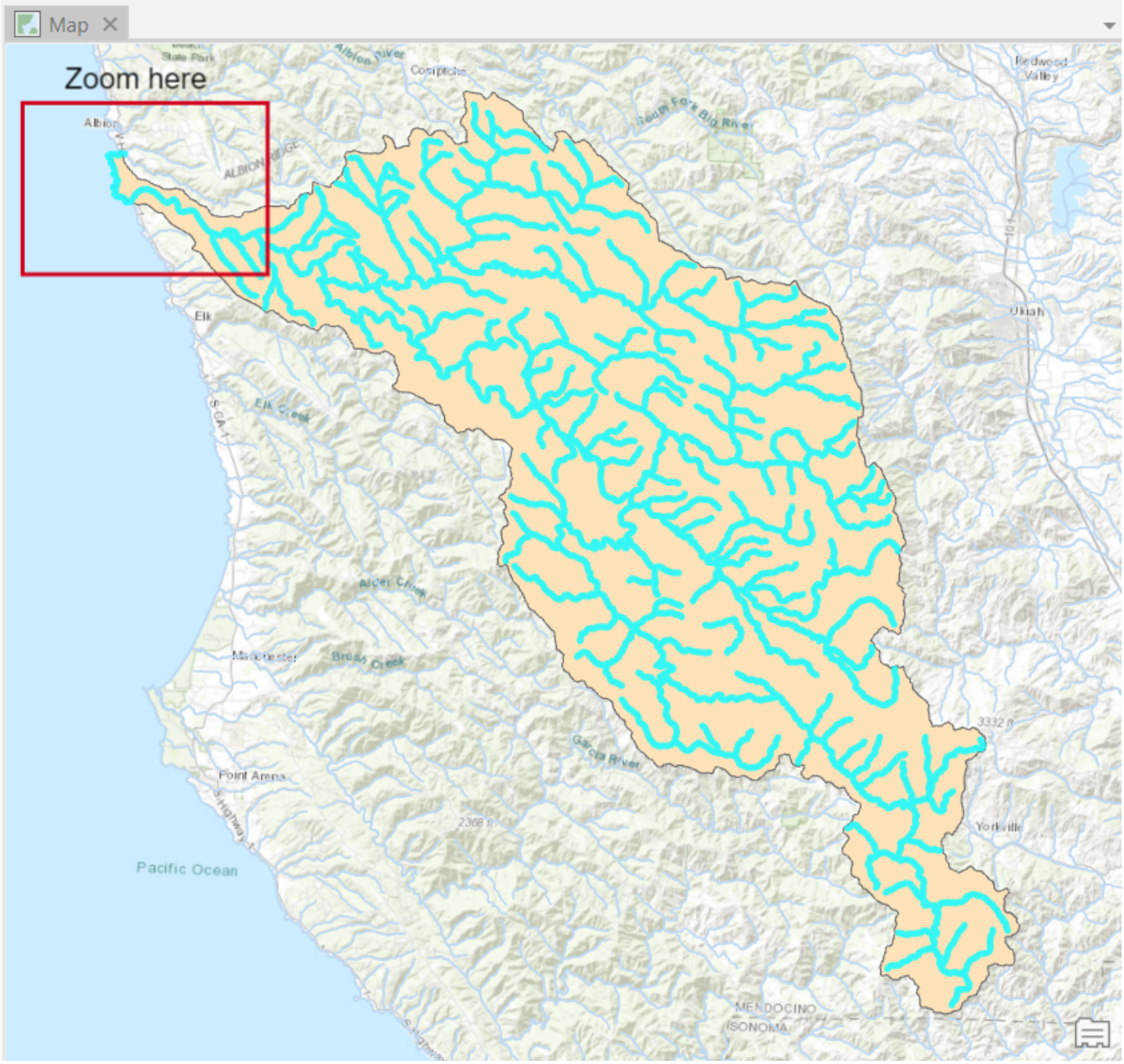

Select By Location
Input Features
navarro_boundary
1
NHDFlowline
navarro_boundary
Intersect
Selecting Features
Search Distance
Meters
Selection type
New selection
Invert spatial relationship
Apply
OK
Select By Location
Input Features
NHDFlowline
Relationship
Intersect
2
Selecting Features
navarro_boundary
3
Search Distance
Meters
Selection type
New selection
Invert spatial relationship
Apply
OK
4

## 11.2 Validating our selection

Now, we'll see in bright blue any features that are part of our new selection (side note: the color that selections appear is configurable in settings, though relatively common in ArcGIS to leave it as its default)

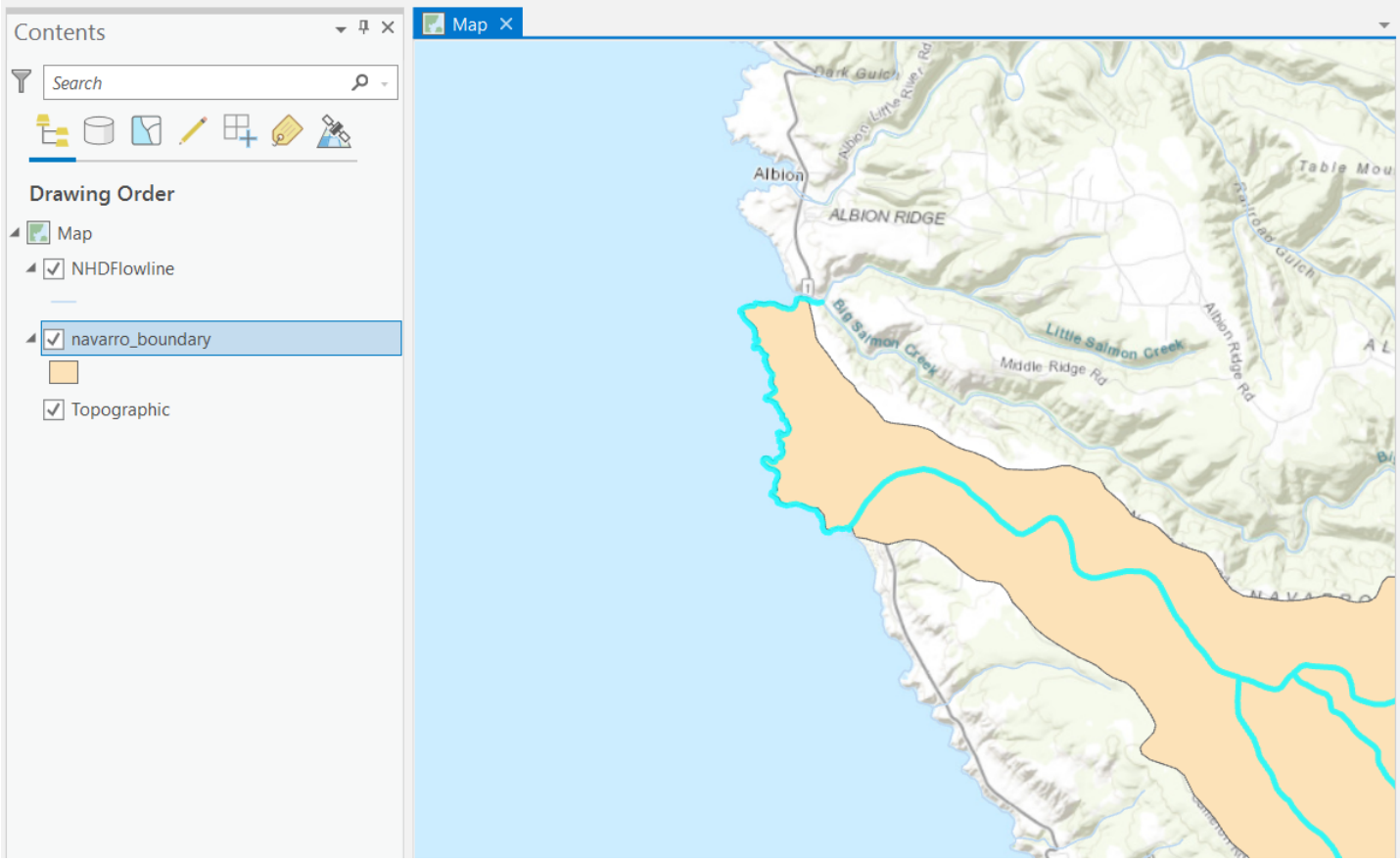
Let's verify our selected features look appropriate. It's always good to verify GIS operations by inspecting them and make sure you get the expected results. Then, if the results are unexpected, determine whether you it's because you expected the wrong thing, your workflow doesn't get you where you wanted to go, or you (or ArcGIS) made a minor error. Mostly, this selection looks correct, but I notice something odd on the coast - it looks like the coastline is selected, and I didn't want that.

Use the zoom tool to zoom into the area of the coast shown in the screenshot.


Map
Zoom here
Albion
Elk
Elk Creek
Alder Creek
Manchester
Brush Creek
Point Arena
Pacific Ocean
Garcia River
Ukiah
Redwood Valley
Willits
Yorkville
MENDOCINO
SONOMA

## 11.3 A coastal selection

Yep, it looks like coastline (if you want to confirm, use the Explore tool again to click on it and see what's there). Let's remove this item from our selection using the manual selection tools.



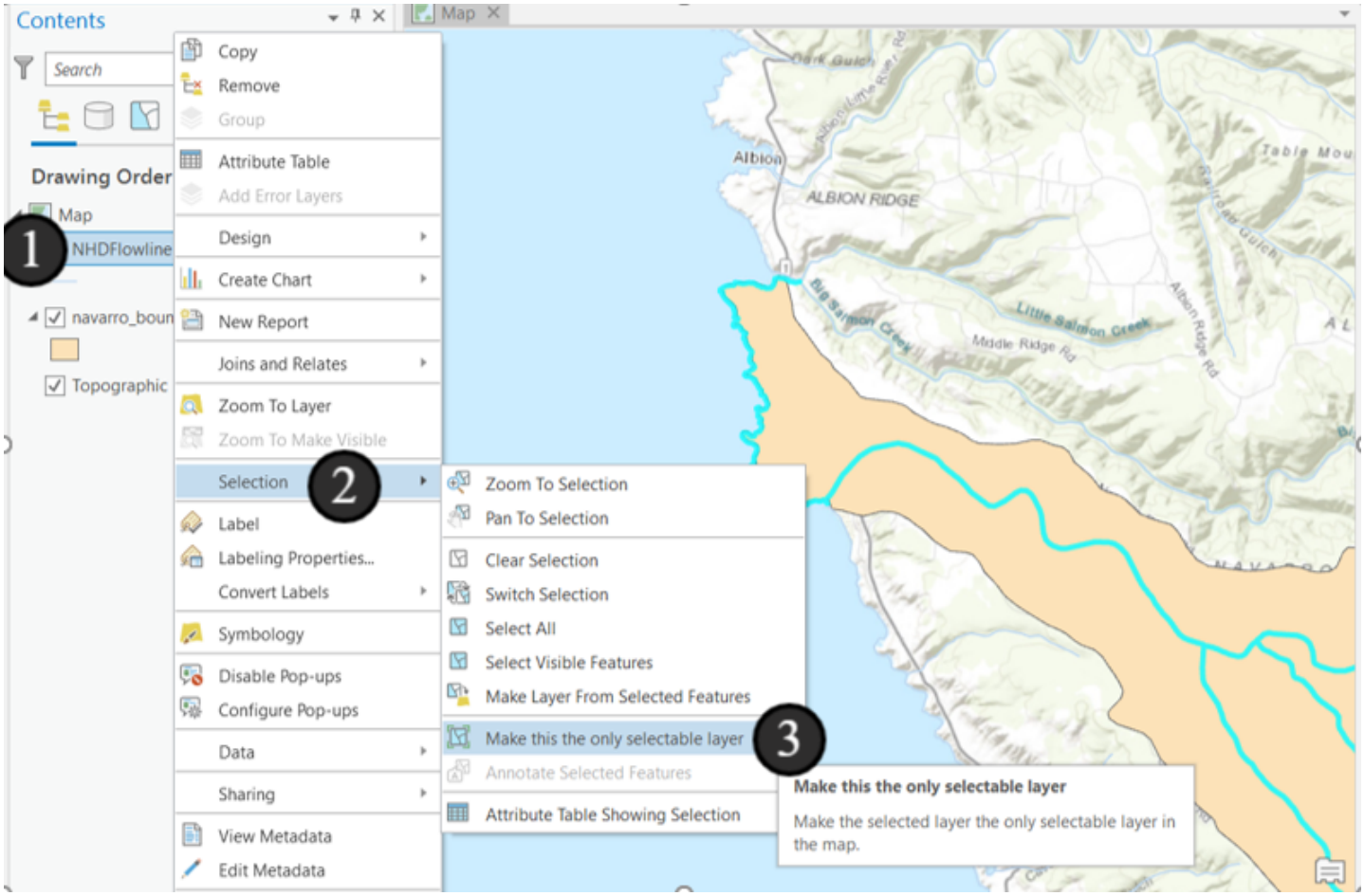
## 11.4 Setting up the selection

First, let's make sure the selection changes we want to make occur only on the NHDFlowline layer. We going to use a process called *interactive selection* which involves clicking on the map. By default, interactive selection affects all layers, and your map display will get messy when you start clicking around!

We'll set some options in this step to prevent that, but if at any time your selection becomes a problem that you can't correct, click the Clear button to the right of the *Select By Location* button (from the previous step), and your selection will be cleared. Then go back to the Select By Location step (again, don't do this if your selection remains intact).

Let's make it so that only the flowlines can be selected.

1. Right click on the layer in the Contents pane.
2. Hover over the *Selection* submenu
3. Click *Make This The Only Selectable Layer* - after choosing this option, interactive selection will only modify this layer and won't select features in other layers

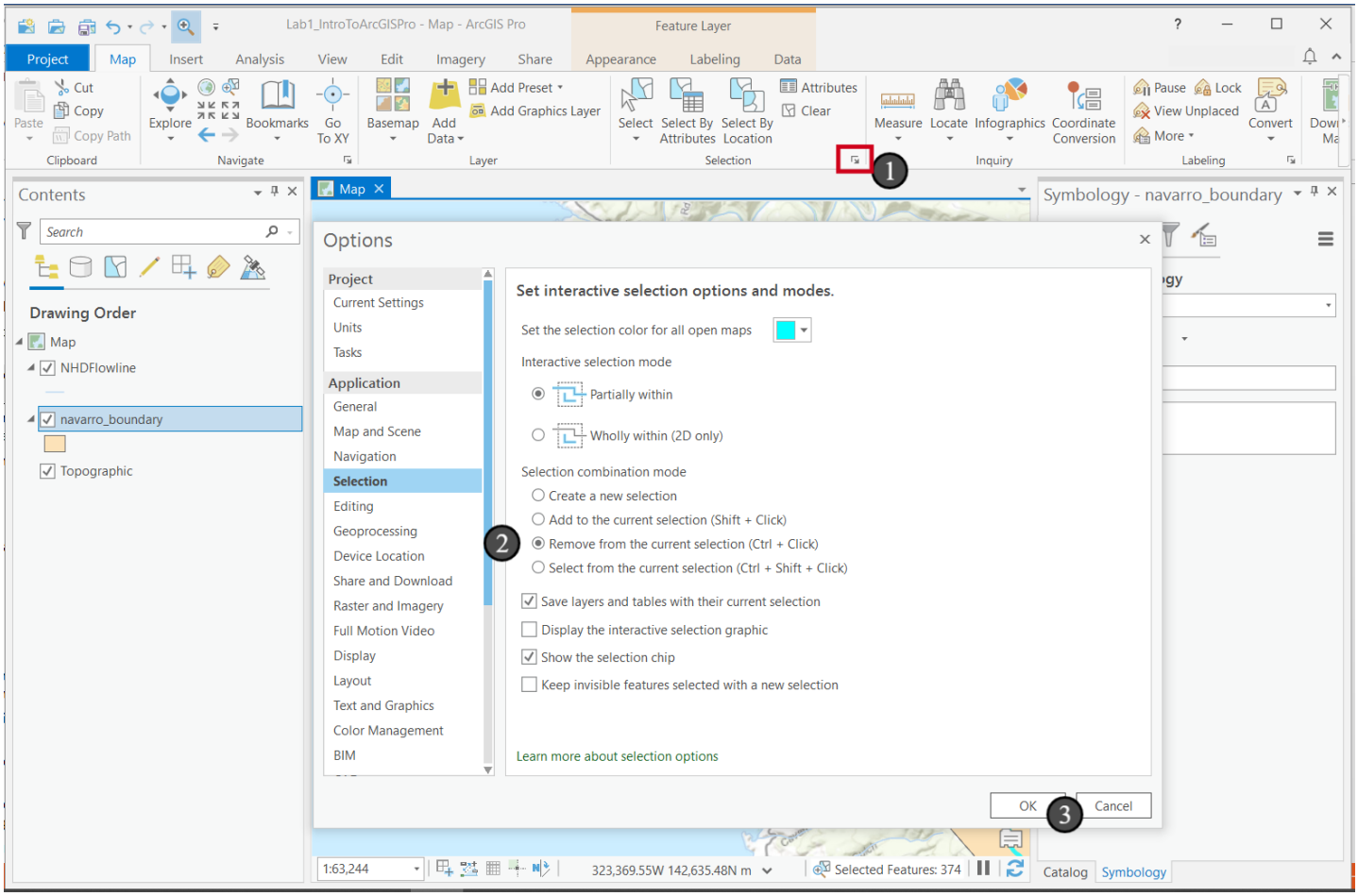


## 11.5 Changing the selection method

Now let's make it so we can't accidentally ruin our new selection when we click on the map - by default, we'll create a new selection when using interactive selection, possibly getting rid of the selection we created with the Select By Location tool.

1. On the main ribbon, click on the small corner arrow in the Selection section (in the bottom right of the Selection tools cluster).
2. In the Options pop-up window, select "Remove from the current selection" to change the selection method so that when we click on the map, items will be removed.
3. Click OK.

Note this process - if you want to create new selections interactively within this project in the future, you'll want to open those options back up and switch to *Create a New Selection* mode.

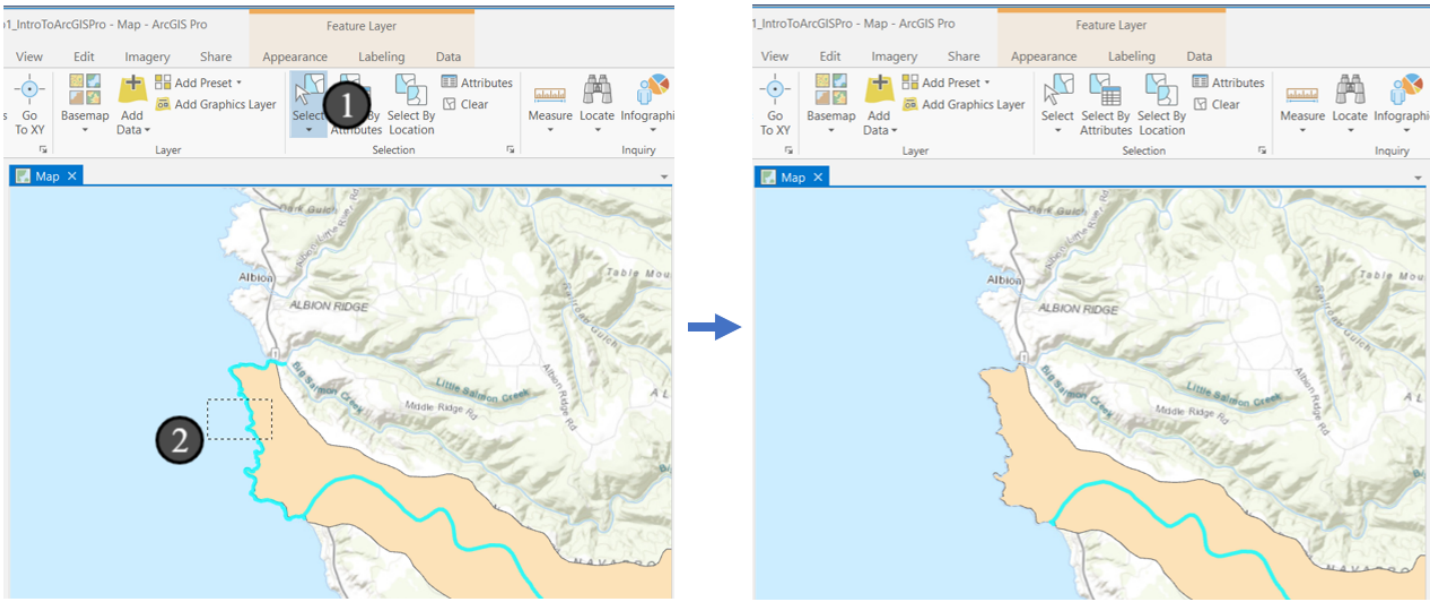


## 11.6 Manually modifying the selection

Now let's modify the selection of rivers to remove the coastline

1. Click on the *Select* button in the ribbon to activate the interactive selection tools.
2. Click and drag the mouse to draw a small box over any part of the coastline. Afterward, that *feature* will no longer be highlighted and it will no longer be part of our selection.

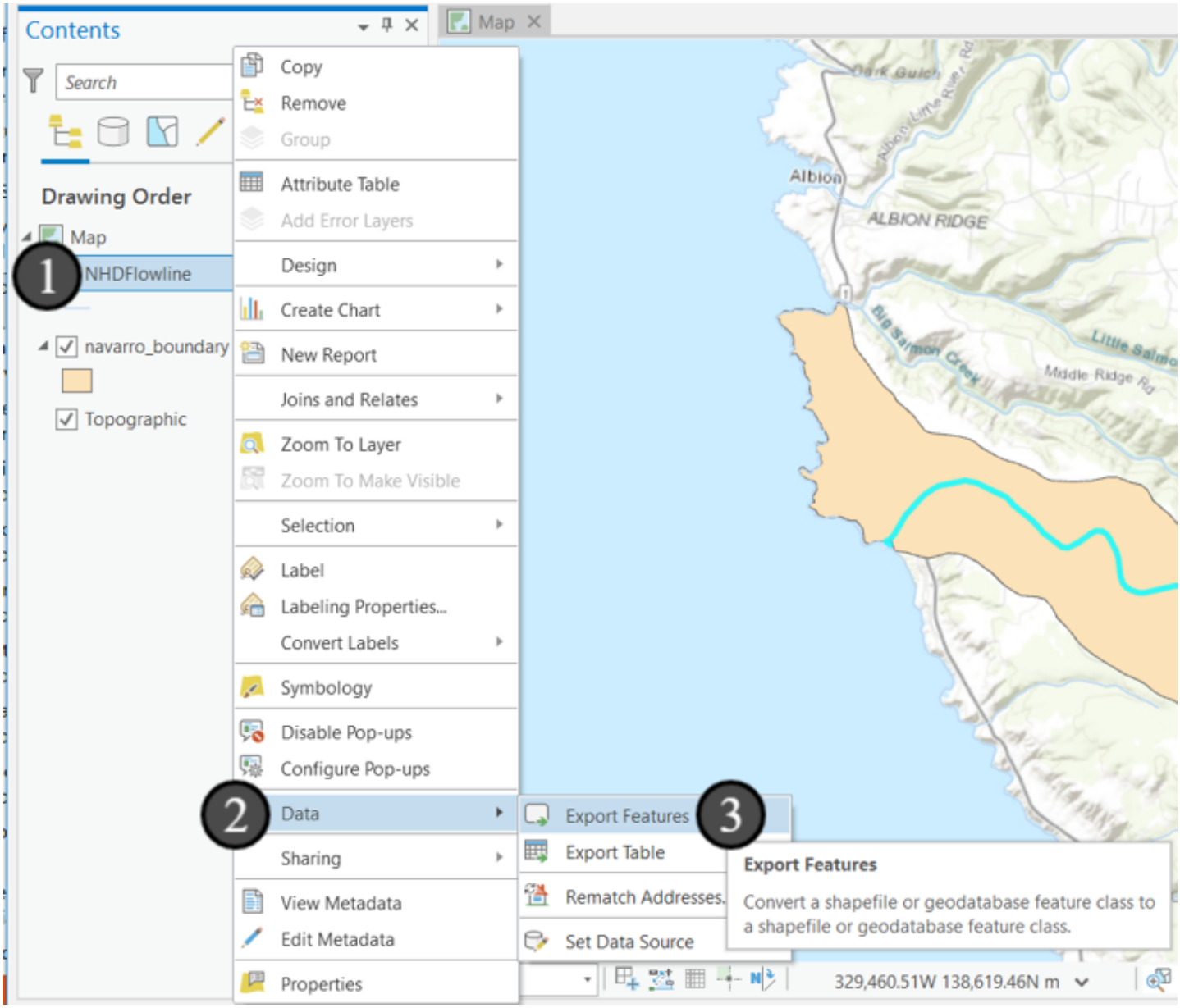
Note: You don't have to create a box around the entire feature that you want to select - your selection just needs to touch each feature you want selected somewhere. If it turns out that you select too few features, you can hold down the shift key and select another feature to add more features to your selection.



## 12. Saving out our new data layer

Now that we have a selection of the rivers in Navarro River watershed, let's save our selection as a new *feature class* (NHDFlowline and navarro_boundary are both feature classes) so we can use it in our map permanently. To do this, we want to export the selection.

1. Right click on NHDFlowline in the table of contents
2. Hover over *Data* to access the flyout menu
3. Click *Export Features*



## 12.1 Give it a name

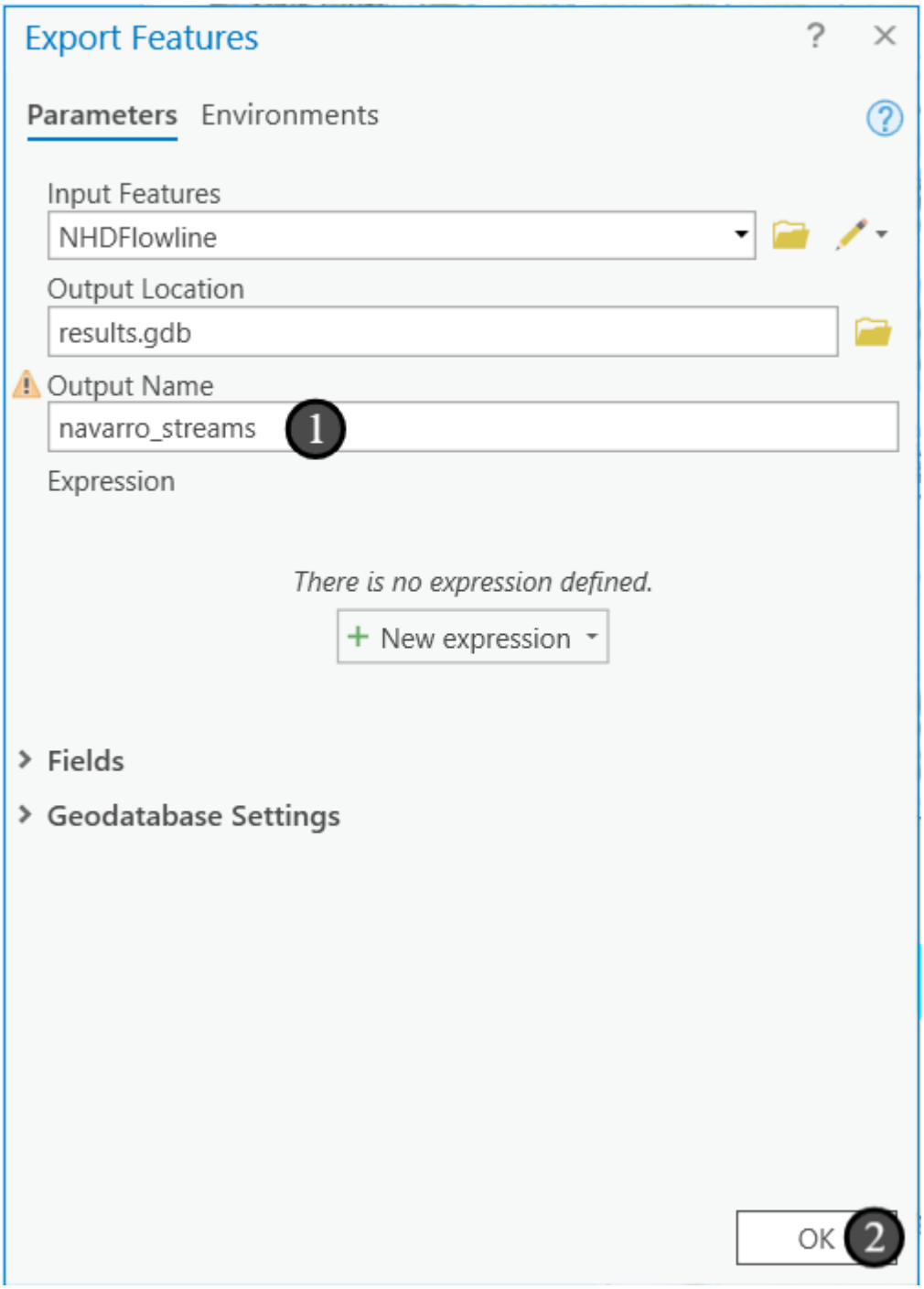
The Export Features dialog box will pop up. We have the option to select the Input Features dataset, the Output Location, and the Output Name.

Input Features will already be set to *NHDFlowline* because we accessed this popup through that feature layer. ArcGIS also helpfully sets an Output Location for us as well - remember from the beginning of this tutorial when we mentioned a *Default Geodatabase* in our project folder? This is where it comes into play. ArcGIS uses it as a default place to save data to, so whenever we do processing operations or exports, it has a place contained in our project folder to save it to, keeping everything together. It also has a nice data management benefit of keeping all of our *derived* data separate from the input data, so we always have a clean set of the input data to work from in the future (I *highly* recommend that you never save data to a geodatabase or folder you received or downloaded - keep it separate so you can always restart your analysis or answer questions about where data came from!)

1. So all we need to do is give it a name in the box labeled *Output Name.* Call the layer *navarro_streams.* Note the underscore. Any ideas on why we might put an underscore in a name? Historically, many computer programs had trouble with spaces. Some components with that trouble are still a part of ArcGIS and they create mysterious errors. It's best to avoid the problem entirely and use something like underscores in place of spaces. (You'll find this is standard practice in most computer science-related fields - spaces create enough problems to not be worth it)
2. Click OK to export the selection.

You might be thinking right now "I chose the Export Features tool, so why isn't it exporting all of the lines instead of just the selected ones?" Well, by default, ArcGIS tools only operate on selections, if a selection is present. In other words, most common operations in ArcGIS will work with a layer as if it is only composed of the selected records.You don't need to have a selection to run an export - without a selection, it'll just use everything in the data layer. But by using selections to subset data, most tools will only use that selection, which is very useful when designing workflows, because we can manually subset the data and make sure we got the right parts, then feed it into many automated processes.

Occasionally, this behavior of only working with the selected records is a challenge for us. For example, if you have a selection on a layer, which happens quite a lot in regular validation and other workflows, and you forget about it, you might accidentally export only part of your dataset--be careful with that! If you don't want that behavior, in most cases you'll need to clear your selection (which we'll do in a moment). And always inspect the results of your export before proceeding to make sure you didn't accidentally have a selection active that you didn't intend and thus didn't save out the data you thought you saved!

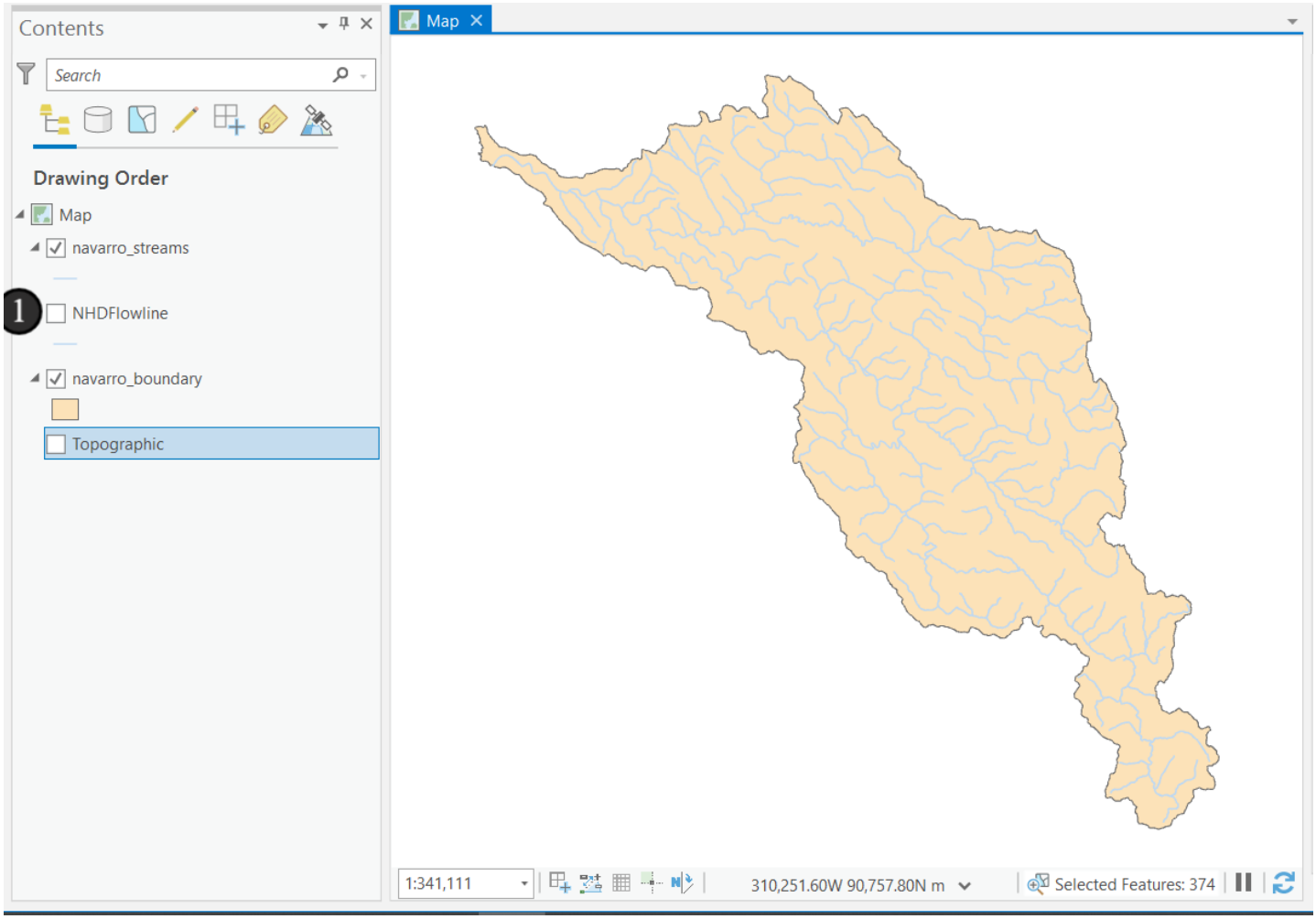

Export Features
Parameters
Environments
Input Features
NHDFlowline
Output Location
results.gdb
Output Name
navarro_streams
1
Expression
There is no expression defined.
New expression
Fields
Geodatabase Settings
OK
2

## 12.2 Verify our data

After saving out the selection, ArcGIS Pro will automatically add the new layer to the map. However, it may be difficult to see thanks to the selection that is still in place.

1. Verify your exported data looks correct by turning off NHDFlowline so that the selection temporarily disappears and the surrounding data is hidden (click the checkbox next to it). You can also turn off the basemap if you like (uncheck the box next to the *Topographic* layer).

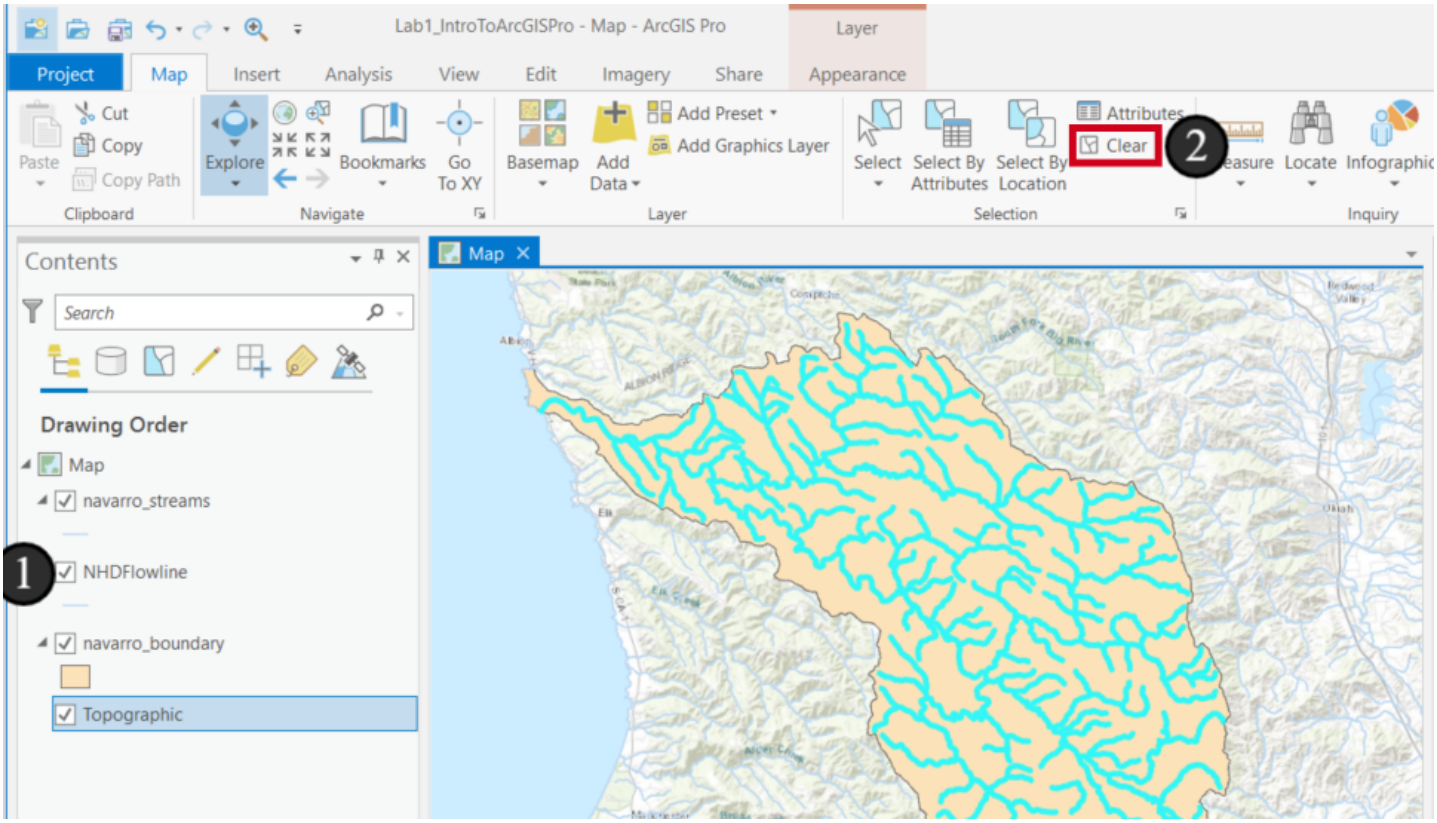
For now, zoom around and take a look. The color of the streamlines should match the input dataset; if it changed to a random color, apply appropriate symbology as we did before. Once you're ready, proceed to the next step.



## 12.3 Clear selected features

Now that we're done with our selection, let's clear our selected features.

1. Turn NHDFlowline back on so you can see what happens.
2. Click the Clear button in the Selection section of the main ribbon. The selection will disappear from your display and would need to be recreated manually if we wanted it back. We no longer have a selection active on NHDFlowline, and any future exports would save the entire dataset.

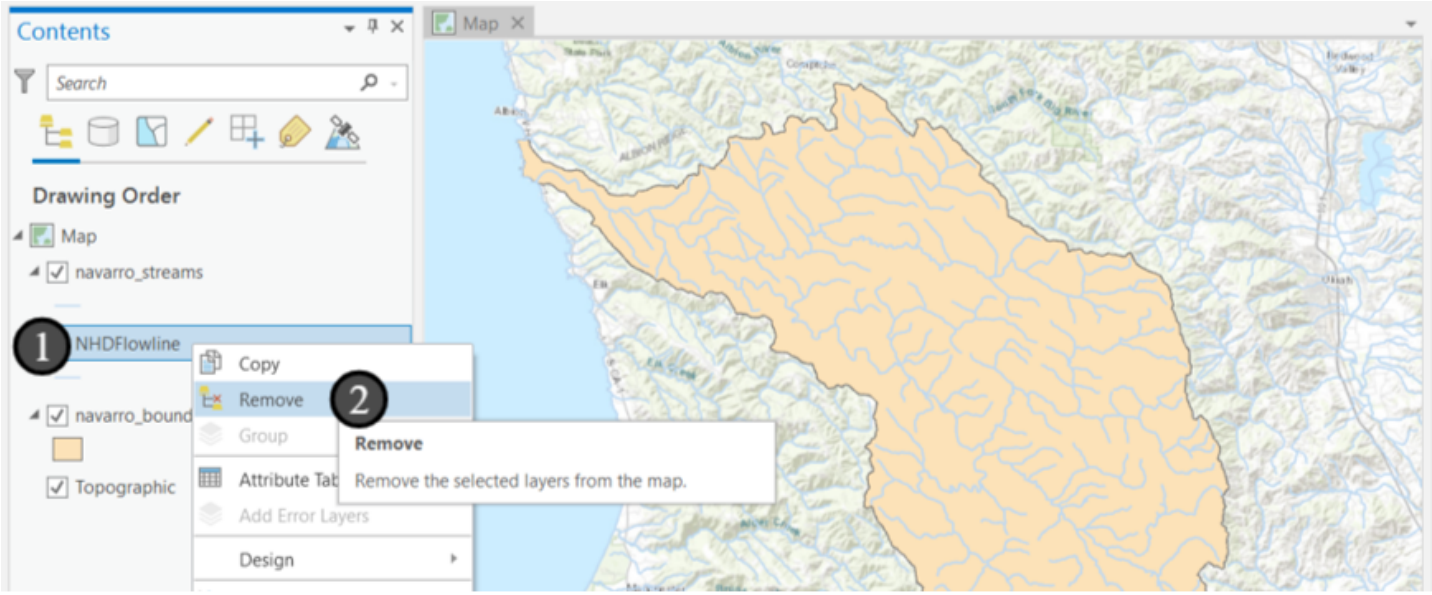


## 12.4 Remove NHDFlowline

Now that we've subsetted our data, we can remove NHDFlowline from our map document - we no longer need the full set of rivers in order to produce our map of the region. We can add it back later, should we want to, but we don't need it in this document.

1. Right click on NHDFlowline
2. Click *Remove*

The NHDFlowline data remains in the geodatabase we loaded it from, but is no longer in our map. If we wanted to add it back, we'd go through the same process as before to add the data (and reapply any symbology).



# 13. Save your project

Don't forget to save your work (ArcGIS is historically known to crash!). You can click on the icon with the purple floppy disk in the upper left hand corner (1), or use ctrl + S. We're only part way through making our map and the next tutorial will continue where we left off here.